PRELIMINARY FINDINGS OF OTA REPORT ON SUPERFUND

(100-68)

HEARING

BEFORE THE
SUBCOMMITTEE ON
INVESTIGATIONS AND OVERSIGHT
OF THE
COMMITTEE ON PUBLIC WORKS
AND TRANSPORTATION
HOUSE OF REPRESENTATIVES
ONE HUNDREDTH CONGRESS
SECOND SESSION

APRIL 20, 1988

Printed for the use of the Committee on Public Works and Transportation

U.S. GOVERNMENT PRINTING OFFICE
89-641 WASHINGTON : 1988

For sale by the Superintendent of Documents, Congressional Sales Office
U.S. Government Printing Office, Washington, DC 20402

H641-18

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PRELIMINARY FINDINGS OF OTA REPORT ON SUPERFUND

WEDNESDAY, APRIL 20, 1988

House of Representatives,
Subcommittee on Investigations and Oversight,
Committee on Public Works and Transportation,
Washington, DC.

The subcommittee met, pursuant to notice, at 10 a.m., in room 2167, Rayburn House Office Building, Hon. James L. Oberstar (chairman of the subcommittee) presiding.

Mr. Oberstar. The Subcommittee on Investigations and Oversight will come to order.

Today the subcommittee continues its inquiry into the Nation's toxic waste cleanup program, Superfund.

The Public Works and Transportation Committee first approved this legislation in May 1980. It was signed into law in December of that year, and amended in 1986. EPA has had a year and a half to implement the new amendments.

It is this subcommittee's responsibility to insure that the agency is implementing the law the way Congress wrote it and intended it to be implemented.

Shortly after the Superfund Amendments and Reauthorization Act of 1986 was signed into law, the Public Works and Transportation Committee asked the Office of Technology Assessment to assist us in "evaluating the practices which have been established by the Environmental Protection Agency in relation to the critical early phases of site cleanup."

We are particularly concerned with EPA's implementation of the preliminary assessment; site inspections; remedial investigation and feasibility study; and the Records of Decision, with particular emphasis on selection of cleanup remedies.

The environmental mission of Superfund, which is to protect human health and the environment, must never be sacrificed to bureaucratic expediency or to budgetary shortsightedness. In 1986 Congress required that remedies chosen to clean up toxic waste sites permanently treat hazardous substances, permanently treat pollutants, and contaminants. The American people deserve and expect nothing less. We can leave nothing less for future generations.

Unfortunately, the preliminary findings by the Office of Technology Assessment indicate that EPA is falling short of the intent of Congress in implementing these 1986 amendments.

The subcommittee, therefore, has asked OTA to provide us with an interim report, focusing on the Records of Decision written under the procedures required by those 1986 amendments. Those ROD's are the legal documentation of the agency's decisionmaking process: how and why it selected a particular cleanup technology at a particular site. The ROD also documents how the remedy complies with Superfund's statutory and regulatory requirements and what other remedies were considered, and why certain ones were rejected.

One of the Public Works and Transportation Committee's major contributions to the 1986 amendments was insistence on permanency of cleanup. We are distressed at indications that far too many ROD's select technologies that leave the wastes onsite, rather than destroying them permanently.

Another problem area pinpointed by OTA is the lack of consistency among the cleanup remedies chosen by the EPA. This lack of consistency is aggravated by cleanup remedies that have little or no technical data supporting their application at a particular Superfund site. We'll hear more about that in the OTA presentation.

The subcommittee also will inquire into the procedures EPA follows for moving up the learning curve, for accumulating a base of knowledge, and how that knowledge is disseminated to the people actually working in the field. Too many of the ROD's reviewed by the OTA appear to have been written in a vacuum of background knowledge and past experience.

There also appears to be a rather large cadre of new people working in the agency without previous experience, a cadre of personnel insufficient to handle the task, not because of ability, but lack of experience.

In 1983, EPA published its first National Priorities List containing 406 toxic waste sites that were considered serious enough to warrant Federal cleanup. Today almost 1,000 sites are on the NPL list with no end in sight.

Fewer than 20 waste sites have actually been cleaned up since the advent of the Superfund program in 1980. We have obviously fallen dangerously behind our goal of protecting human health and the environment.

Before the Superfund program falls any further behind, we need to find out what's going wrong, what's good about it, what's being done well, what needs to be corrected, and how we go about fixing it. That is the process that we begin today.

Superfund is at a critical juncture. With roughly 100 ROD's signed, the program is poised to begin incurring the massive costs of cleanup. So it is crucially important to review those ROD's for what they tell us about the program so far.

In 1980 the American people, the Congress, and the administration committed five years and $1.5 billion to Superfund. In 1986 we committed five more years and $8.5 billion. It's already clear that that commitment will have to be reviewed further before January 1992, and even after so many years and such large expenditures of money the task will by no means by completed. In fact, I find it shocking to read in the OTA report that instead of making progress, we may be falling further behind.

The American people so far have been willing to pay for Superfund. They are willing to pay for clean water. They are willing to pay for clean air.

The Government, both the Legislative and Executive branches, have an obligation and trust to use that money wisely to protect the health of the people and to protect the environment that sustains all life.

We must not lose the people's trust or we will surely lose support for the program. More seriously, we would then lose the means to remove the scourge of toxic wastes on the face of the land.

Looking to the future of the program, the subcommittee will continue its longstanding oversight of Superfund. What we hear today should not dissuade us from the task at hand. We can make this program work. There is will to do so among the people and in the Congress and within the Environmental Protection Agency, dedicated personnel, professionals who want Superfund to work, who want the environment cleaned up.

The final thought: I intend this series of hearings to be a tribute, a lasting one, to our former chairman, the late Jim Howard. He made oversight of the EPA programs, particularly of Superfund, a priority for the Public Works Committee and assigned that priority to this subcommittee. I intend to carry out his will, his desire, that Superfund be an effective cleanup program.

The Chair recognizes the gentleman from Pennsylvania, Mr. Clinger.

Mr. CLINGER. Thank you very much, Mr. Chairman. I want to join with you in welcoming our witnesses who will be testifying before the subcommittee today. I particularly want to acknowledge the presence of Lee Thomas, Administrator of the U.S. Environmental Protection Agency, who has taken time from his schedule to be with us here to share his views with us on this very, very important issue.

Today the subcommittee meets to examine the issue of the implementation of the Superfund Amendments and Reauthorization Act of 1986, popularly known as SARA. While many issues are addressed within the 1986 amendments, the subcommittee has chosen to narrow the focus of this hearing to concentrate on the earlier stages of hazardous waste site cleanup and related policy issues. In so doing, we will examine EPA's process of identifying, categorizing, and studying the risks associated with hazardous waste sites and the selection of the cleanup remedy to be employed.

In examining this process, the subcommittee is aided by the ongoing work of the Office of Technology Assessment, which at the request of this and other congressional committees, is conducting an in-depth study of EPA's implementation of SARA. OTA's work includes case studies of several Records of Decision applicable to the cleanup of specific sites. These case studies give some insight into how well the cleanup technologies employed meet the statutory requirements of permanence and protection of human health, the consistency of the process by which remedies are selected, and the way in which statutorily imposed deadlines for action may be influencing agency policies and actions.

In order for the committee and the Congress to realize near-term benefits from the study, OTA has agreed to release a preliminary report, the subject of which we are going to learn more about this morning.

Previous subcommittee inquiries into Superfund implementation, conducted prior to SARA's enactment, documented the difficulties and pitfalls encountered by EPA in establishing regulations, implementing procedures, and accomplishing cost-effective cleanups. In plain language, early program implementation was a mess.

Just when the program began to get its feet on the ground, the inability to enact Superfund reauthorization legislation in timely fashion imposed new funding uncertainties upon the EPA and most certainly contributed to further implementation delays. But that is all history now, water under the dam. We're one and a half years into SARA, the course is clearly set by statute, and we want to assure ourselves and the public that what we thought we were bargaining for back in 1980 is finally being accomplished.

Today we are going to attempt to assess the progress made since the 1986 amendments. While the case studies of OTA may highlight program shortcomings or inconsistencies, I hope we will also explore with the Administrator and his staff some of the brighter parts of the picture in order to be able to compare and contrast and better understand why some approaches have worked, others have failed.

I look forward to this type of exchange and to a productive day's session, Mr. Chairman. Thank you.

Mr. **OBERSTAR**. I share the gentleman's views and look forward to a very, very productive session.

I ask unanimous consent that the statement of our colleague, Norman Y. Mineta, appear in the record at this point.

[Mr. Mineta's statement follows:]

STATEMENT OF HON. NORMAN Y. MINETA

Thank you, Mr. Chairman. I want to express my appreciation to you for holding this hearing to give us an opportunity to review Superfund implementation.

As you know, I have long been a strong advocate of the Superfund program. We cannot afford to delay the cleanup of hazardous waste sites. But we must be sure that appropriate and effective technologies are selected. It will be expensive to clean up these sites, and Congress must watch carefully to assure that the money is spent wisely.

My district has the unfortunate distinction of having six sites on the National Priorities List. In addition, there are about 90 additional sites under the jurisdiction of other Federal and State cleanup programs. I have serious concerns about the coordination of these fragmented efforts. No single person knows everything about the various sites. If we do not have a coordinated, national policy, we may not be able to solve the problem.

I appreciate the opportunity to learn more about the implementation of this important national program. I hope that our inquiry will contribute to a more efficient process to clean up these dangerous sites as quickly and economically as possible.

Mr. **OBERSTAR**. To assure that we will get off on the right foot and a very productive day, we have a very distinguished witness, the Senator from New Jersey, a Member of that body dedicated to the issues of the environment. It's unusual to have a Member of the other body testify before House committees, but not unusual for this Senator who has previously testified before this subcommittee, demonstrating his very genuine, profound concern, willingness to make that extra effort.

He's been a vigilant observer and enforcer of the Nation's environmental laws and a participant in writing them and making them stronger and more effective. You have in your own subcommittee in the other body done a superb job. We welcome the partnership that is represented by your presence here today, Senator. Welcome to the subcommittee.

TESTIMONY OF HON. FRANK LAUTENBERG, A U.S. SENATOR FROM NEW JERSEY

Senator Lautenberg. Thank you very much, Mr. Chairman. Our mission is too big not to have us work cooperatively on getting on with the cleanup of the environment. We've got to work on it together.

Thank you, Mr. Chairman, for holding this hearing. I thank you also for your recognition of the contribution of our good friend, Jim Howard, recently deceased, as a native of the State of New Jersey and as a fellow legislator. We deeply appreciated the contribution that Jim Howard made to our country and to our State and his district in terms of the environment, and in terms of the infrastructure requirements of our country. We thank you for noting his contribution and your pledge to carry on the legacy that he left. We treasure that.

My Subcommittee on Superfund and Environmental Oversight has held a number of hearings on SARA's implementation, and I would like to share with you some of our findings. Before I do, I would like to note several recently missed deadlines. April 17th marked the passing of five Superfund deadlines. EPA missed three of those. They failed to revise the National Contingency Plan, or NCP, the master regulation for the Superfund program. They did not issue the rule to amend the hazard ranking system, the method for rating sites for placement on the Superfund Priority List. Finally, EPA did not issue the final report on the prevention, monitoring, and detection of chemical release. My understanding is that final drafts of the report are in questionable shape.

In addition, we are still waiting for EPA's annual Superfund report to Congress that was required on January 1st, and EPA has already acknowledged that it will miss the upcoming deadline for site inspections. Beyond the missed deadlines, we've seen other major problems.

We have increased Superfund spending levels in the 1986 Superfund amendments, and that had helped produce large increases in actual dollars spent. Last year EPA obligated about a billion dollars. But we have got to do more than spend money. We have to spend it efficiently. And we must do more than create a massive Federal program. We've got to manage that program effectively.

Last year I focused on the management of Superfund. Our investigations uncovered a program hampered by a slow and noncompetitive contracting process. In fairness, EPA has attempted to respond to these problems. They are moving to reform the contracting process for both short- and long-term cleanups. The agency is moving to bring more competition and fewer handoffs to the program. But EPA is not moving fast enough. They failed to meet their projections for bringing new contractors on line. In some cases, they are lagging far behind their own milestones.

We have also examined the serious manpower crisis plaguing Superfund. The Superfund turnover rate exceeds the rate of turnover for the rest of the Federal Government, and the Superfund workforce is younger typically than the Federal workforce. Inexperienced staff are facing one of the Nation's most complex and demanding environmental problems.

I am pleased to see that EPA is moving on a suggestion that I made to beef up training. But, as I suggested in December, even more needs to be done.

Another major problem is enforcement. Congress gave EPA some powerful legal tools, but EPA still has not used them to the degree that they can or should. Recovery of cleanup costs is up, but so is spending. The result is that taxpayers, not polluters, are still picking up too much of the tab.

Since the beginning of fiscal year 1988, we have had no EPA referrals to the Justice Department to compel cleanup. The program has also failed to distribute cleanup work effectively and evenly throughout the fiscal year. Last year we saw an 11th hour rush to sign cleanup decisions, so-called records of decision. Over two-thirds of the 1987 decisions were put off until the last month of the fiscal year.

EPA's actions in New Jersey were even worse. All of New Jersey's ROD's were signed in September, and EPA has already fallen behind its plans for ROD completion this year. They are also lagging behind their targets for completing studies, investigations, designs, and actual cleanups. Right now we are waiting for the new additions to the Superfund Priority List. EPA has continued to delay, but until a site is listed, not even the preliminary work can begin.

Mr. Chairman, I am troubled by EPA's continued failure to manage this program effectively. Preliminary examinations by OTA and others raise questions over compliance with SARA's cleanup standards. EPA continues to hold an unlawful interpretation of the law's groundwater cleanup standards. We are seeing that codified in the early drafts of the NCP. Reversal of that policy will apparently require a judge who knows the law or an Administration that cares to enforce it.

Mr. Chairman, what we have before us is a program with great potential. As much as I personally respect Lee Thomas and his colleagues, we are faced with a troubling reality. This administration does not have the commitment it takes to get the job done. What does that mean for Congress and its oversight committees?

One possible route is simply to criticize and wait for November, but the more responsible path is to identify the problems and to put forward solutions. Last December I put together a 16-point plan to improve the program. Now over the next few months I will be expanding that plan in a report. I will also continue to work to encourage EPA to implement these ideas.

Mr. Chairman, the oversight task is obviously a large and often frustrating one, but this hearing today demonstrates that it is a task that neither you, nor I, nor the Congress are going to shy away from. I appreciate the opportunity to be with you this morning and commend you once again for holding this hearing. I urge you to continue the task that you have taken upon yourself.

Mr. **Oberstar**. Thank you very much, Senator. I greatly appreciate your participation, your willingness to come to this body and to share your own views and experience in this subject, as you have done on so many other occasions. This demonstrates the very genuine commitment that you have, as you put it so well, not just criticizing, but to finding the solutions and how to go about putting those solutions into effect.

Your 16-point program—and I won't detain you with a lot of questions because I know you have other commitments, but do you envision in the inquiries that your committee has done already need for legislative changes or management improvements within the agency under the existing law?

Senator **Lautenberg**. Mr. Chairman, we prefer not to legislate those changes. What we prefer to do is to work with EPA to encourage them to participate with us. Though I criticize, I must tell you that I see the commitment individually over there that could get this job done. Frankly, I think they are hobbled by the Administration's view on how serious this task is. But, hopefully, by laying out this program, we will encourage them to examine some ideas on how the program ought to be managed. Perhaps we can enlist their full cooperation and ask them to challenge the orders from upstairs and say, "Okay, we've got a task to do and we want to get on with it."

Mr. **Oberstar**. It's really a matter of will power and of moving ahead and making the commitment to use the resources and use them effectively. I worry less about missing deadlines than I do about the commitment to get to that objective. If they miss it a little bit if at least they consult with the Congress and say, "These are the reasons we're having trouble."

In the 1972 major rewrite of the water pollution control program there were 137 deadlines. The Environmental Protection Agency, just newly created, missed every one of them. But the program went forward because there was an excitement and a commitment and a desire.

We put those deadlines in the act realizing that many of them would be unrealistic, but they were a yardstick by which to measure progress, and, as my predecessor, John Blatnik, used to say, "a blow torch on their behind to keep them moving."

The gentleman from Pennsylvania?

Mr. **Clinger**. Thank you very much, Mr. Chairman. I have no questions. I certainly want to commend Senator Lautenberg on the leadership that he has taken in this very, very vital area. Thank you very much for your contribution to our hearing.

Senator **Lautenberg**. Thank you very much.

Mr. **Oberstar**. The gentleman from New Jersey, Mr. Gallo? We welcome you to the subcommittee. Although not a member of the subcommittee, the gentleman has very great interest in the issue and we're glad to have a member of the full committee participating.

Mr. **Gallo**. I want to thank you, Mr. Chairman, for allowing me to sit in on this important hearing. It's certainly one that has a great deal of impact on the State of New Jersey with 99—soon to be 101—sites, Superfund sites. It certainly is of great importance to our State.

Again, I want to say to the Senator I would like, Nunber one, to see the 16 points. I haven't seen those. I think that could be very helpful. I think anything that is offered by you and your committee is welcome because we look at Superfund as something to move forward and actually start the cleanup process.

I'm not sure that all of the deadlines, as mentioned by the chairman, were realistic to begin with, but we have to have something to go by. I think we're moving forward at this particular point, but these hearings will crystallize some of the problems that we have. Maybe we can come up with some solutions to those problems.

I thank you, Mr. Chairman.

Mr. **OBERSTAR**. Thank you very much.

The gentleman from Pennsylvania, Mr. Kolter?

Mr. **KOLTER**. No questions, Mr. Chairman.

Mr. **OBERSTAR**. The gentlewoman from Connecticut, Mrs. Johnson?

Mrs. **JOHNSON**. Nothing, thank you, Mr. Chairman.

Mr. **OBERSTAR**. The gentleman from Georgia, Mr. Rowland?

Mr. **ROWLAND**. No, thank you, Mr. Chairman.

Senator **LAUTENBERG**. Mr. Chairman, if I might, one closing comment because my distinguished colleague from New Jersey made reference to missed deadlines and suggested that perhaps the dates were unrealistic.

Superfund was reauthorized at the end of 1986. This is April 1988. I think certainly we allowed enough time for the required tasks to be done. Though deadlines are not an objective unto themselves, they are a step along the way in completing a process that's very complicated and very long term in its management. Therefore, each one of these benchmarks has to be met in order to have a program that is being managed effectively.

Mr. **OBERSTAR**. I think the Senator makes a very important point, and that is the rewrite of Superfund was done against a background of five years of experience with the original act. The deadlines put into SARA reflected experience and expectations that were based upon realistic assessment of where we ought to be.

Senator **LAUTENBERG**. Thank you very much.

Mr. **OBERSTAR**. Thank you very much, Senator. We appreciate your participation.

[Senator Lautenberg's prepared statement follows:]

STATEMENT OF SENATOR FRANK LAUTENBERG

I'd like to thank you Mr. Chairman for holding this hearing. My Subcommittee on Superfund and Environmental Oversight has held a number of hearings on SARA's implementation.

I'd like to share with you some our findings. Before I do, I'd like to note some recently missed deadlines. April 17 marked the passage of five Superfund deadlines.

EPA missed three of them.

They've failed to revise the National Contingency Plan—or NCP—the master regulation for the Superfund program.

They didn't issue the rule to amend the hazard ranking system—the method for rating sites for placement on the Superfund priority list.

Finally EPA didn't issue the final report reviewing systems to prevent chemical releases. My understanding is that final drafts are in questionable shape.

In addition, we're still waiting for EPA's annual Superfund report to Congress that was required on January 1. And EPA has already acknowledged that it will miss the upcoming deadline for site inspections.

Beyond the missed deadlines we've seen other major problems.

We increased the Superfund spending levels in the 1986 Superfund amendments. That's helped produce large increases in actual dollars spent. Last year EPA obligated about $1 billion.

But we must do more than spend money. We must spend it efficiently. We must do more than create a massive federal program. We must manage that program effectively.

Last year I focused on the management of Superfund. Our investigations uncovered a program hampered by a slow and non-competitive contracting process.

In fairness, EPA has attempted to respond to these problems. They're moving to reform the contracting process for both short and long-term cleanups. The Agency is moving to bring more competition and fewer handoffs to the program.

But EPA is not moving fast enough. They've failed to meet their projections for bringing new contractors on line. In some cases they're lagging far behind their own milestones.

We also examined the serious manpower crisis plaguing Superfund. The Superfund turnover rate exceeds the rate for the rest of the federal government. And the Superfund workforce is younger than the federal workforce. Inexperienced staff are facing one of the nation's complex and demanding environmental programs.

I'm pleased to see that EPA is moving on my recommendation to beef up training. But as I suggested in December, more needs to be done.

Another major problem is enforcement. Congress gave EPA some powerful legal tools. But EPA still has not used them to the degree they can or should.

Recovery of cleanup costs is up. But so is spending. The result is that taxpayers, not polluters are still picking up to much of the tab. And since the beginning of fiscal year 1988, we've had no EPA referrals to the Justice Department to compel cleanup.

The program has also failed to distribute cleanup work effectively and evenly throughout the fiscal year. Last year we saw an eleventh hour rush to sign cleanup decisions—so-called Record of Decisions.

Over two-thirds of the 1987 decisions were put off until the last month of the fiscal year. EPA's actions in New Jersey were even worse. All New Jersey's Records of Decision—or RODs—were signed in September.

And EPA has already fallen behind its plans for ROD completion this year. They're also lagging behind their targets for completing studies, investigations, designs, and actual cleanups.

Right now we're waiting for the new additions to the Superfund priority list. EPA has continued to delay. But until a site is listed, not even preliminary work can begin.

Mr. Chairman, I'm troubled by EPA's continued failure to manage this program effectively.

And preliminary examinations by OTA and others raise questions over compliance with SARA's cleanup standards.

EPA continues to hold to an unlawful interpretation of the law's groundwater cleanup standards. We're seeing that codified in the early drafts of the NCP. Reversal of that policy will apparently require a judge who knows the law or an Administration that cares to enforce it.

Mr. Chairman, what we have before us is a program with great potential. As much as I personally respect Lee Thomas and his staff, we are faced with a troubling reality.

This Administration does not have the commitment it takes to get the job done. What does that mean for Congress and its oversight committees?

One possible route is simply to criticize and wait for November.

But the more responsible path is to identify the problems and to propose solutions. Last December I put together a 16-point plan to improve the program. Over the next few months I'll be expanding that plan in a report. I'll also continue to work to encourage EPA to implement these ideas.

Mr. Chairman, the oversight task is obviously large and often frustrating. But your hearing today demonstrates it is a task that neither you, nor I, nor the Congress will shy away from.

LAUTENBERG SAYS EPA MISSED SUPERFUND DEADLINES

WASHINGTON.—Senator Frank R. Lautenberg (D-N.J.) today told a House Subcommittee that the Environmental Protection Agency [EPA] is falling behind schedule on a range of tasks under the Superfund law. His comments came before the House Investigations and Oversight Subcommittee of the House Public Works and Transportation Committee.

Lautenberg, chairman of the Senate Superfund Subcommittee criticized the EPA for failing to meet three April 17 deadlines:

(1) EPA failed to revise the National Contingency Plan—the master regulation for the Superfund program.

(2) EPA didn't issue the rule to amend the hazard ranking system—the method for rating sites for placement on Superfund's National Priorities List.

(3) EPA didn't issue the final report reviewing systems to prevent chemical releases.

In addition, EPA is failing to follow through on its own commitments to begin cleanup work and reform cleanup contracting.

"EPA is breaking its own promises, and the promises made under the new Superfund law, to get toxic waste cleaned up," Lautenberg said.

Lautenberg also criticized the EPA for failing to make polluters pay for cleanups. "The taxpayers, not the polluters, are picking up the tab because the EPA isn't pushing hard enough," Lautenberg said.

Since October, the EPA has failed to bring any polluters to court to force cleanups.

Mr. **OBERSTAR**. Our next witness is the Administrator of the Environmental Protection Agency, the Honorable Lee M. Thomas, with a number of associates. At least, we have Mr. J. Winston Porter, Assistant Administrator, Office of Solid Waste and Emergency Response; Henry Longest, Office of Emergency and Remedial Response; Mr. Jonathan Cannon, Office of Waste Programs Enforcement.

Have we got everyone? That's it.

Witnesses sworn.

[The witnesses respond "I do."]

Mr. **OBERSTAR**. Thank you.

Welcome, Mr. Administrator, to our subcommittee once again on a matter of environmental concern and a matter of stewardship of your agency over and your administration of the several laws with far-reaching significance under the jurisdiction of the Environmental Protection Agency.

We had the privilege of having you here shortly after you took over the administration of EPA. We're impressed with the seriousness and professionalism with which you have undertaken many responsibilities.

Superfund is one of the biggest, and we look forward to your assessment of where EPA is and to a dialogue about where we go from here.

TESTIMONY OF HON. LEE M. THOMAS, ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY J. WINSTON PORTER, ASSISTANT ADMINISTRATOR, OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE; HENRY L. LONGEST II, DIRECTOR, OFFICE OF EMERGENCY AND REMEDIAL RESPONSE (SUPERFUND); JOHN CANNON, DIRECTOR, OFFICE OF WASTE PROGRAMS ENFORCEMENT; AND THOMAS W. DEVINE, P.E., DIRECTOR, OFFICE OF PROGRAM MANAGEMENT AND TECHNOLOGY

Mr. THOMAS. Thank you very much, Mr. Chairman. I appreciate the opportunity to be with you and the members of the committee to discuss the Superfund program. As you indicated, it is clearly one of the biggest responsibilities that we have at EPA, and I commend you for holding the hearing.

I would also like to join you in a tribute to the late chairman of the committee. The impact that Jim Howard had on EPA and the Superfund program in particular was one that was very profound and will be longstanding. It's a real tribute to him, I think, as we talk about the kinds of effort that we're making to deal with the hazardous waste problem in this country.

Superfund is a very complex program. What I would like to do this morning is run through some highlights of where we are in dealing with the problem of cleanup under the Superfund program. I have submitted full testimony. You have copies of some charts. Those could be incorporated into the record in full. I would like to just highlight those and then get into some questions that the committee may have.

Mr. OBERSTAR. Without objection, the entire prepared testimony will be included in the record following your presentation along with the charts, reduced to appropriate size.

Mr. THOMAS. Thank you, Mr. Chairman.

As you know, the purpose of Superfund is to deal with mismanagement of hazardous waste that occurred in this country over a number of years. Its purpose is to identify, assess, and clean up toxic waste sites, uncontrolled toxic waste sites. It needs to be remembered that Superfund is only one of the efforts that is underway to deal with this issue of toxic waste cleanup. It is a big one, a very big one, and we want to talk about it today.

But, in addition to that, EPA also manages the RCRA program, Resource Conservation and Recovery Act. Under the authorities we have there, we are dealing with all of operating industries in this country, those who receive permits from us, looking at their facilities and the sites on their facilities that they've closed in the past, whether they be hazardous waste or solid waste, to determine whether they need to be cleaned up and, if so, how they should be cleaned up. That also is turning out to be a very large program for cleanup of toxic waste.

Additionally, the underground storage tank program which you authorized in Superfund is a cleanup program related to leakage from underground storage tanks.

Finally, State programs are growing in importance, I believe, in that many of the States have developed independent programs. In addition to working cooperatively with us, they have developed independent programs for identifying and cleaning up sites that don't come under any other Federal programs.

So there is a large amount of cleanup that's underway in this country. Clearly a major component in a major program that we're charged with implementing is the Superfund program.

Let me turn briefly, then, to an overview of where we are with Superfund, and particularly where we are and have come in the last 18 months since you reauthorized the statute.

The first chart shows you that as far as the two big components of Superfund that we often hear about, how many sites have we taken a look at totally to determine whether they are sites that warrant cleanup, and then how many have we put on a Priority List, you can see that in our inventory of sites to be reviewed, nearly 30,000 sites.

Of that number, nearly 27,000 sites have had a preliminary assessment, an assessment that's largely carried out at a State level to determine whether that's a site that warrants a full field inspection. Of those that do, we've inspected nearly 9,000 of those sites. Of those that have been inspected, nearly 1,000 have been placed on our National Priority List; that is, the list of the most serious sites that require and now are eligible for funds under the Superfund program.

Let me talk a little bit more about specifics, then, of what's occurred since the reauthorization of Superfund, that 18-month period of time that you've talked about in your opening statement.

Preliminary assessment: we had planned to do a little over 5,000 during that 18-month period of time, and we've completed a little over 6,000.

Site inspections: we had planned to do about 1600. We've completed about 1800.

RIFS: that's the first stage on a Priority List site. That's the engineering study. We had planned to initiate 185. We have initiated about 160 of the engineering studies of the big National Priority List sites. This is just during the 18-month period. This is clearly not the total number for the program, but only since reauthorization.

Records of decision: that's the key point once the engineering study has been completed. Once we've looked at the alternatives under the law and under the criteria, we are given a cleanup record of decision. We had planned 167. We've done 111. Clearly, we've fallen short there, and we want to talk to you a little bit about why some of the difficulties. Remedy selection is one of those difficulties, and we'll talk about that in some more detail.

Remedial design: that is, once the remedy is selected at one of these priority sites, then designing the remedy, the engineering design for cleanup. There were 128 planned; completed, 70. Clearly, the major shortfall in the program to date has been remedial design. That shortfall to a large extent flows from the shortfall in records of decision.

Until you make the record of decision, you can't move it into the design stage. We'll talk to you a little bit more about that whole process.

Remedial action: that is, moving forward with the actual cleanup at the Priority List site. We had planned 79. We've moved forward with 60.

Deletions: that is, actually getting sites off of the list. We planned 17. We have done 12. I think the total number now of sites that have been taken off the list since the program started is 25 site completions. That is sites where we have completed the work; now we're reviewing the monitoring the site to determine whether it should be taken off the list. It shows 8. Actually there's another 10 there.

Removals, which is that part of the program where we go in and do an immediate cleanup, some of them fairly complex, you gave us the authority to go up to as much as $2 million or more on a removal, clearly that's a big part of the program. We've made it bigger, as you can see. We have conducted 350 site removals in the last 18 months. As a matter of fact, we've surpassed over 1,000 sites that we have dealt with, many of them completed work at that site, through the removal authority we've got under Superfund.

The enforcement part of Superfund is also a very significant part of the program. Many of the sites we're moving forward with responsible parties paying for or conducting the work under the enforcement authorities we've got.

RIFS, as you can see, we've exceeded the targets. We had 68 sites. We have responsible parties who under our consent decree, court approved, are moving forward with the RIFS.

Again, the remedial design, the remedial action, that's the actual design and cleanup, 32 sites where we've got responsible parties. Those are the big settlements you often read about with multiple companies that agreed to clean up a site.

Cost recovery settlements: during that last 18 months 57 of those site cost recovery settlements, overall referrals to the Justice Department during that period of time — that is, where we couldn't settle, we moved on forward there and we're going into litigation, 52 sites, 52 actions during that period of time.

It's a fairly steady stream of cost recovery actions now that we're as far into the program as we are. Many of the sites that we began work on in the early days of the program, concluded the work, and we are now moving into cost recovery. So you see the number of cases and the number of settlements going up substantially.

In addition to that actual work that's underway, very substantial all over the country, both enforcement and fund dominated, we also have worked on regulations, policy, and guidance. When you reauthorized Superfund, you expanded it considerably. You added a number of new components. You added a number of new authorities. We have moved forward to comply with the majority of those many, many deadlines incorporated into that authority.

For instance, we've issued over 30 guidance or regulations in that 18-month period of time. We have missed a few, but I must say we've met most of them.

The National Contingency Plan, which is the big regulation on Superfund, was to be completed by the 17th of this month. It's in final proposal and, hopefully, will be at OMB in the next month. We're close to the deadlines. Even where we've missed them, we're very close. As you've said, Mr. Chairman, the will is there to move those regulations and guidance through the system.

As an example, title III, which I'll speak to in a minute, over 10 major regulations were issued, all on time according to the time lines that were incorporated. That's an entirely new program that you authorized in Superfund. So many regulations, policy, and guidance documents have been issued.

Title III, as I mentioned, many guidance documents and regulations issues—this is the community right-to-know section. It is one of the largest information collection programs that the Government is now accountable for. It's a major controversy in some cases, a controversy which will increase, I would suggest, over the next few months.

We now have moved forward with the emergency planning component. Every State has set up a State commission, local commissions, and is moving forward with the emergency planning component.

We've gone forward with training and emergency systems review in every State, cooperating with the Federal emergency management agency.

We've moved forward with all of the information collection requirements, and in July you will see over 30,000 industries in this country submitting comprehensive toxic release information to the Federal and State governments that will be available to citizens throughout this country on a plant-by-plant basis, based on several hundred chemicals. That program is moving forward, a very difficult but a large program, a new program that was authorized in Superfund.

A second new program that was authorized when you completed your reauthorization work on Superfund was the leaking underground storage tank trust fund program. That is a new trust fund in addition to Superfund to deal with leakage from underground storage tanks. Again, we've moved forward with that program. We've now got cooperative agreements with virtually every State. The program is largely implemented at a State level to clean up or to enforce and have responsible parties clean up sites where there has been leakage from an underground petroleum storage tank.

We find and are finding that's a very successful program, and the States were anxious and ready to move forward with the implementation. We're moving the program substantially ahead.

Finally, Mr. Chairman, the component of the act that you also expanded significantly was that of research and development. Demonstration projects on trying to move from bench scale to commercial scale on a variety of new techniques for hazardous waste treatment and cleanup—21 of those demonstration projects have been authorized. Field work has been completed on five of those, technical support centers set up to support our staff in the field.

Additionally, research grants on several new techniques, hazardous waste research centers at universities, a whole range of new authorities for HHS, the Agency for Toxic Substances and Disease Registry, the National Institute of Environmental Health Services, a range of new research and development authority that you authorized has all moved forward aggressively toward implementation.

Let me just say, in conclusion, that what you reauthorized and passed and was signed into law 18 months ago was a comprehensive reauthorization of Superfund. It went far beyond the initial effort that we had in Superfund and authorized a number of new programs.

I have been with the agency now for five and a half years. This may be one of the last times I will have the opportunity to come to Congress and talk about the Superfund program in that I feel I'm probably nearing the end of my term as the Administrator of EPA as this administration winds down.

I have some observations about the program. I must say that I've come to gain a perspective on the input of many people, both Congress, the Office of Technology Assessment, GAO, and many others, as far as their views of Superfund are concerned.

That perspective is one that they have an important role to play. They have an important role to play as we try to move forward and deal with a major, major effort in this country, and that is cleanup of toxic waste sites in many different places, many different varieties, the technology that is developing, solutions that we're trying to move forward with, where we're on the edge of new technology development. They all have a role to play, an important role to play, as we try to shape this program.

I have come to the conclusion that, one, the program is a large program. It's a complex program. It's an important program. There are multiple pressures on the program that we have to recognize.

There is the pressure of timeliness. There are those who feel we move too slow. I find there are those who feel we move too fast as well.

There are the pressures of degree of cleanup: how much do we clean up each site? There are those who feel we don't clean up enough. There are those who feel we clean up too much.

There are the pressures of public fear. I find the public is fearful both from a toxics and what does it do to their health and their children's health as well as what does it do to their property values. All of that feeds into the pressures for other things such as timeliness and degree of cleanup.

I also find there is tremendous pressure as far as cost is concerned. The cost in many of these remedies is extremely high. People feel we're spending too much; other people feel we're not spending enough.

There's the pressure of enforcement because, in addition to Congress saying and the law specifying that we want you to move forward and clean these sites up, you also have said, "And we want you to find who is responsible for them and make them pay retroactively."

So we work on the enforcement program and we work on it hard.

In conclusion, I would say that I think we have made a lot of progress under Superfund. I'm proud of the progress we've made in getting the program underway. I'm proud of the contribution I could make to that.

It's a long-term commitment, however. It's a commitment on the part of Congress, on the part of the agency, for the long term, not the short term. We will be into this program for many, many years. That's my prediction. We've got to insure that what we are doing is the best possible and make the best decisions possible for the long term.

We also are making the most cost-effective decisions, and we're also taking into account as much as possible the public's concerns, the public's desires, as we try to deal with these sites that affect them so directly.

Finally, I would conclude by saying I have never in over 20 years now of managing Government programs seen a more dedicated group of people than I have seen at EPA. For five and a half years I have worked with managers at headquarters, managers in the field. I have seen them conduct public hearings.

I have seen them receive some of the strongest abuse and criticism of any managers I have ever seen in the public sector, and yet I have seen them come back time after time after time again to move that program forward, to try to make the right decision, to try to be responsive to everybody who is pushing in every direction on the individual Superfund sites to keep the objective in mind of, one, clean the site up and do it so that they have confidence that it's a good cleanup. Secondly, get it done as quickly as it can be done, taking into account their ultimate objective of cleanup. Finally, move a strong enforcement program. Get those responsible parties, get those responsible parties to pay.

The people in this agency are dedicated to those goals. We have problems, as Frank Lautenberg said, of turnover, a young staff, but there is a core of very senior managers who have been with this program, who have stayed with this program, who have worked this program, who maintain a good direction for this program. I believe they as well as I will look forward to working with you as you go through and explore where we are, how the program needs to be refined, is it consistent with the approach that Congress thinks we should be taking for the long term as well as the immediate solution? They will be there longer than I. I've got great confidence in those people and their ability to continue this important program.

Thank you very much, Mr. Chairman.

Mr. **OBERSTAR**. Thank you very much, Mr. Administrator, for a very heartfelt testimony delivered with depth of feeling, depth of conviction, sincerely, and I respect that. I appreciate it.

With you, I think I could look back on your stewardship at EPA and think we will be able to say that you brought this agency back to its mission from a depth of moral despair in the Gorsuch years, and that's tribute to the professionalism that you brought to the leadership of that agency.

Within EPA I have been associated with its programs since the days when the Federal Water Pollution Control Administration was down in the seventh sub-basement of the old HEW building down the street here, when a young lawyer named Murray Stein was heading it up and a few folks from the Public Health Service were trying to help make it a reality, and moved it from a time when scientists stood around with test tubes saying, "Yes, indeed, this is polluted water. It has all these terrible things in it."

A few people like my predecessor John Blatnik and Bob Jones of Alabama sat side by side in this committee for many years, and others, got together and said, "We've got to do something about it, not just verify that the water is polluted. Clean it up." They moved that agency forward.

From the time that it began its expanded role, there was always a high degree of enthusiasm, a high degree of morale within that agency, a sense of accomplishing something lasting, of permanent benefit for America.

We've seen by the votes in the Congress that the American people are willing to pay for a clean environment and willing that their legislators vote tough laws, realistic ones, to get on with the business of cleanup.

When it comes to deadlines, I said in the 1972 act—I know we made a count of 137 deadlines written into that law—30 days for this, 60 days for that, and 120 days for something else, 180 days—137 of them, and I don't think EPA made a single one.

The point is they kept the program moving ahead. They had a huge job—build staff, expand, write regulations, manage a massive effort, and we've had a second period of rebuilding in the years since you have taken over from your predecessor.

But the agency has matured; the programs have matured. We cannot take deadlines lightly. I'm the last one to criticize people for being late. My father used to tell me when I was a youngster, "You're going to late for your own funeral." I told him, "Well, I'll make it, though, I'm sure." [Laughter.]

That's what we want you to do—to make it, to get there and to do it right.

I realize, as I have read your detailed testimony and reviewed the assessment by OTA, that there is a tension between reaching that deadline and reaching it right, moving too fast and not doing the job well enough. We want to explore that with you today.

I would say to members that we would like to have a round of questioning, and then we would like to take the testimony from OTA and question OTA, and then bring back the EPA professionals to give them an opportunity to respond. That will be proper and beneficial to the process of our hearing.

To get to a couple of key questions, one is the amount of money, which was vastly increased. Superfund under SARA is like the EPA clean water program under the 1972 Clean Water Act—a vast increase in the amount of money committed to cleanup, from $1.5 to $8.5 billion for the extra cost of permanent cleanup, of toxic wastes.

It appears that the agency is not spending money for permanent cleanup. Why not? Why isn't EPA choosing destruction of toxic wastes over leaving the waste inground?

There are numerous examples that OTA will report on which I would like you to make note of later on and perhaps respond.

I think that's the essence. That was a matter hotly debated here in this committee in this room during the hearings and the markup and in conference. Let's get right to that issue.

Mr. THOMAS. Mr. Chairman, you're right about the tension in the program between how much cleanup you do and what you do. I would have to say that I disagree with an overall conclusion that the agency is not spending money for permanence and treatment.

Clearly, the approach that Congress specified—and it's one that I agreed with in the reauthorization of Superfund—was treat waste and aim toward permanent solution for the long term, not just the short term. We feel we are doing that.

If you look at the records of decision, some of which OTA will speak to, some of which we can speak to, you will find a significant amount of them include treatment such as incineration, treatment some of which is in the ground, an in situ treatment process. The majority of the remedial sites will involve treatment at the site of one form or another. It also will involve some amount of residuals that are going to be left at that site.

The remedies that we end up with in the majority of those sites include treatment of all or a portion of the waste, and then a final remedy for the remaining residuals at the site. Often it includes a RCRA cap. In other words, you cap it. Often it includes a program for a long-term monitoring site.

But we feel like clearly we went forward in carrying out the treatment approaches that Congress talked about, and you see the substantial increases in cost. This program is a very expensive program. You see the increased cost per site that went up to where we're now talking about routinely sites between $10, $20, $30, $40, $50 million. That is a lot of money to spend at a site for cleanup. Those are the kinds of dollar figures we often talk about at these sites.

Mr. **Oberstar**. To be specific, the OTA findings indicate, and an analysis of data for us indicates, that roughly 1 in 5 cleanups, 19 percent, involve permanent destruction.

Mr. **Thomas**. I don't agree with the figure. I think it depends on whether you're counting the total number of actions at a site—we have multiple actions oftentimes at a site—or whether you're talking about the final action at a site, which often is the one where most of the treatment is incorporated. But, Win, you may have a better feel for it.

Mr. **Porter**. Mr. Chairman, I think our numbers are more like this: if you look at the 75 records of decision that were alluded to in the report, where final action as Mr. Thomas referred to is taking place about 60 percent involved some treatment. I think what they did is they took all the records of decision, some of which are multiple at a site, so certainly the first so-called operable unit or action may not involve treatment, but by the time we finish in well over half the times we involve some kind of treatment.

We have also been increasing——

Mr. **Oberstar**. Wait a minute. Involve some kind of treatment?

Mr. **Porter**. Treatment of the principal threat or the contaminated materials.

Mr. **Oberstar**. I'm talking about permanent destruction, not just removal, but permanent destruction.

Mr. **Porter**. As Mr. Thomas indicated, typically at a site and some of these sites are massive, would cost hundreds of millions of dollars to dig everything up and to literally burn it. What we typically do or often do where we have concentrated materials is to treat those materials. We incinerate or we use chemical precipitation or something of that nature in some instances. Where there is very dilute material over many, many, many acres that's at safe levels, we sometimes do some kind of containment remedy.

We're finding, Mr. Chairman that we are using a combination of remedies at sites. Often we have a combination of remedies, but treatment is going to be involved in one form or another at most sites.

I think the rub has kind of come, if I can say this, where people want a simple solution. They want to say, "Why didn't you treat every pound of dirt at that site?" The reasons are very simple, one, it is often not needed. Two, I would be doing about eight sites a year with $900 million there allocated to treatment, because you're talking hundreds of dollars. The law also said for us to be cost effective, and we've just found that we can't literally dig up all the dirt for acres and acres and acres and treat it in any kind of cost-effective way. Further, we don't think it's necessary.

I think the tension has really been in terms of the degree of treatment. We can certainly talk about that if you want to do so.

Mr. **Oberstar**. Well, you have sort of a two-stage process: early removal, early action at a site, which is of some urgency, and then the final action, the final cleanup. The early removal and the remedial actions are of two different natures, two different intensities; is that correct?

Mr. **Thomas**. Actually, let me add one thing because I think it gets kind of confusing. The removal program is a program where you often go in with site stabilization on a program or an immediate cleanup where there is an imminent threat, but under the remedial program, which is a long-term program, you also have oftentimes multiple actions.

We break it down into operable units. You may have a number of operable units at a site under the remedial stage, some of which are treatment operable units, some of which are your containment operable units.

Mr. **Oberstar**. Give us an example. Give us a case study of one.

Mr. **Porter**. Okay. Love Canal is as good as any example. At Love Canal we dug up contaminated materials from creeks and sewers, particularly sewers. We contained it onsite until we could put in the treatment unit.

We've just recently decided to have an incinerator onsite which will burn all that material we stored as well as other material in the creeks for permanent destruction.

I could name others, but typically we have a staged approach to these sites.

Mr. **Oberstar**. One of the areas of Love Canal is a huge field, if you will——

Mr. **Porter**. That's right.

Mr. **Oberstar** [continuing]. Which is covered over and blocked off with impermeable materials with the hope of channeling the waste material through the underground runoff into containment areas. Is that working?

Mr. **Porter**. That is——

Mr. **Oberstar**. I have observed the area——

Mr. **Porter**. Yes.

Mr. **Oberstar** [continuing]. At its early stage.

Mr. **Porter**. You're right, Mr. Chairman, we have contained the original chemicals there, as you described it. We're also treating the leachate from those chemicals in an ongoing fashion at a treatment plant. Our data shows the plume is actually—that is, offsite migration—has actually decreased in size. The remedy appears to be working.

But there is a case where we used containment. It would be two things—I think if we tried, for example, to dig all that up and burn it or some other way: it would cost hundreds of millions of dollars probably and probably be more dangerous, frankly, to do it than to leave it where it is for at least the time being.

Mr. **Oberstar**. What about Lee's Lane Landfill in Kentucky where there was an expedited response by a contractor involving an action not to treat waste, but covered two hot spots of the site?

Mr. **Porter**. I don't have a lot of detail on all of these sites, but I'll try to respond the best I can.

Mr. **Thomas**. One of the problems we've got, just to be real frank with you, Mr. Chairman, is that we haven't had complete access to the same information that OTA has. The study is not completed yet, as I understand it, that OTA is doing. This is a preliminary review that they are giving you.

We've gotten copies—we've gotten an indication of what sites they were looking at, but we haven't had an interaction and a lot of detail.

Mr. **Oberstar**. Has OTA staff consulted with your staff as they've gone through this at various stages? Have you had an opportunity for dialogue with them?

Mr. **Porter**. Not much opportunity. We have had some dialogue, but, frankly, we would like to have more. We would like to interact with them more on what they are doing because we want to solve this problem together, and we have had a little difficulty getting information.

Mr. **Oberstar**. Be patient. You'll have an opportunity this morning.

Mr. **Porter**. Okay.

Mr. Chairman, shall I go ahead.

Mr. **Oberstar**. Would you go ahead, please?

Mr. **Porter**. What we have done there, as I understand it, and, I must qualify this by saying I don't have the latest information on all these sites, we've installed a gas collection system. We've put in an alternative water supply. In addition, we've capped hot spots.

Now I can only assume, given all the facts in the case, and we did look at other alternatives, that this was the one that made the most sense with respect to both the technology, the community input, the State input, all the factors that go into a remedy.

Mr. **Oberstar**. Well, let me go on to another question because I want to keep myself within the same time frame as everyone else.

The matter of schedules—it's too easy to get into a fingerpointing game and matching time frames: you did this within the time frame; you missed the deadline or schedule.

However, in the course of the Superfund conference—and I was a conferee and I remember time and again a representative for EPA was asked by both sides in the conference for comments, and again and again conference committee members were assured that EPA could meet the schedules adopted in the conference and meet the schedules while cleaning up toxic waste sites as envisioned in the standards set forth in section 121 of the act. I have that image vividly in mind of the young lady who repeatedly stood up in the late hours of the night, in the early hours of the morning, answering questions: "Yes, we can do this."

Question: is EPA going to meet permanent cleanup directives of section 121 and begin the 175 remedial cleanups by October 1989? And what about the quality? My concern is quality of cleanup at those sites.

Mr. **Thomas**. Mr. Chairman, that's exactly the tension. We do feel like we're going to be able to meet those schedules. The primary one that you mentioned Congress was most concerned about was the 175 remedial action starts: will you be able to meet that? My answer today is, yes, we feel we will. The tension is: will we be able to meet it with quality cleanups? We feel as though we will. That's exactly what we're aiming for.

I know there is some concern on the part of some people that maybe the pressure to meet that number is going to cause us to back away from quality remedies. That's not the direction that we're giving our staff. We want to meet the numbers. Congress says they want us to meet the numbers, but we're also saying, "Look, we want remedies out there that are good remedies." We feel we'll be able to meet the numbers.

Mr. **Oberstar**. There are concerns expressed in the OTA analysis and by others, and by staff analysis that we've done, about the quality of cleanup, calling something cleanup that may be something else, just a short-term remedial or removal to some other site, creating perhaps a subsequent problem.

We'll come back to other questions that I have about treatment technologies in later questions. However, at this point the Chair will recognize the gentleman from Pennsylvania, Mr. Clinger.

Mr. **Clinger**. Thank you very much, Mr. Chairman.

Thank you, Mr. Thomas and gentlemen, for being with us today to explore this most contentious area, as you have indicated, a very large program which occupies a great deal of your time at EPA.

It is a massive problem, and I guess I'm interested in finding out how much is it growing. In other words, I know that we keep adding and identifying sites that are going to require some action being taken. At what rate are we adding new sites to the inventory?

Mr. **Thomas**. Mr. Clinger, I think overall we're not adding sites in the sense of the kind of sites that we're dealing with under Superfund today. The cleanup of leaking hazardous waste sites is one that I think might be with us a long time. That's why I said the long-term commitment is so important for this overall effort, not just under Superfund but under our other programs as well.

But the key to not adding sites is insuring that we've got a good hazardous waste regulatory program to prevent the adding of sites, to insure that we've got a good solid waste regulatory program to prevent adding sites. Those kinds of things are equally, if not more, important in cleaning up the problems of the past, making sure both those things move forward.

I think the hazardous waste site, we've made a lot of progress over the last few years with our regulatory program to prevent the creation of new sites. I think the liability provisions of Superfund are very important as a component of prevention. I think we're making pretty good progress on the solid waste side. We're getting ready to propose upgraded regulations. Congress gave us some additional authority for enforcement of those regulations. I think States and localities are far more conscious of the consequences of mismanaged solid waste sites than they were in the past.

I feel confident that the sites we're dealing with now are the kind of sites that you heard about when the program first started: the Stringfellows and Love Canals, and those kinds of sites. We're not creating new sites like that now.

Mr. CLINGER. You don't think we're going to find those down the road?

Mr. THOMAS. Those kinds of sites clearly, I believe, we have found, identified, and are working on. That's not to say that there are not a lot more sites that we're going to work on for a long time as far as cleanup is concerned.

Mr. CLINGER. I think your point that it's as important, if not more important, to prevent the creation of new sites is a very important part of this thing. I think you already really responded to how the interface between the programs that are devoted to cleanup, like Superfund, or those that are devoted to preventing additions to the problem, RCRA and others, how that interface is working——

Mr. THOMAS. Right.

Mr. CLINGER [continuing]. And whether you feel that you have the resources in terms of the prevention aspect of your job to do that job.

Mr. THOMAS. We have an awful lot of resources in the agency, both for RCRA as well as Superfund. The Superfund program itself, my 1989 budget was $1.6 billion. That's bigger than the budget for the rest of my agency for operational purposes in all the other programs that I manage.

It is a very, very large program. The budget has grown dramatically and the number of people, nearly 3,000 employees now in our agency.

The RCRA budget has also grown dramatically. Even with that, I'll tell you that I think we need some additional resources. You will find that in our 1989 budget we ask for some additional resources to deal with solid waste. I think we've got to increase our role in dealing with solid waste. We moved away from that a number of years ago and probably shouldn't have as a Federal agency.

I think we've got a good, strong staff on RCRA and Superfund. I don't think we need a lot of additional resources there, but I think in some areas you'll see us continue to ask for some increases as it relates to waste management, probably particularly over the next couple of years as it relates to solid waste management.

Mr. CLINGER. Going back to the deadline issue, the question is: with the statutory deadlines regarding initiation of remedial action and completion of remedial investigations and feasibility studies, in effect force EPA to spend Superfund monies on these activities. In order to conserve money in the Fund or have more money available for priority cleanups down the road might the time be better spent devoted to making settlements or trying to reach settlements or privatizing the solutions, and so forth?

Are you being forced, in other words, to pursue perhaps nonproductive solutions?

Mr. THOMAS. I think we had a good debate on this, I thought, when Congress reauthorized the law. As a matter of fact, I remember OTA's input into that whole debate, which I thought was pretty constructive.

We talked about the whole thing, the development of new technology, how much we wanted to spend on remedies today as opposed to containment and remedies that may be available several years down the road. We tried to balance those forces.

There's no question that the deadlines in the statute are important to us, and we try to work toward those deadlines. We don't try to do it in a way, though, that results in just foolishly spending money, and spending money for no purpose. We're not trying to meet deadlines at all costs. We're trying to meet deadlines with remedies that are important and remedies that will be sustained and remedies that are cost-effective.

There's no question in my mind, though, that there's an ongoing debate, there will be an ongoing debate, in Congress and in the public as to whether we're moving too fast or too slow. I, within the last week, have had a report from Congress that said they thought we were moving too slowly and I've had a report that said maybe we're moving too fast.

Tension is built right into this program, particularly when you're looking at new technology, and it's just a reality. It's one of the things we deal with.

Mr. CLINGER. I just want to clarify in my own mind something that you talked about a little bit earlier, and that was on the question of Records of Decision and the fact that you have been criticized for too often adopting a removal solution rather than a more permanent incineration disposal solution. I think you said that—did I understand you to say that there may be more than one record of decision per site? Is that——

Mr. THOMAS. There may well be more than one record of decision per site because on a remedial site, particularly a very large site, that site may be broken down into a number of operable units that over time—as Win said, you may deal with a containment remedy; you may have a record of decision on that. Then you move forward with your next, which may be your interim treatment or your final treatment. You may have an amended record of decision, a new record of decision. You can have more than one record of decision at a site.

Another point I would like to make is the removal program, a program that we can use on a National Priority site or we can use on other sites, and we use it on sites that are not National Priority List sites. It is a good program in my opinion. It is not just picking up waste and taking it away.

Mr. CLINGER. This is the one where you are limited to $2 million——

Mr. THOMAS. There are certain criteria to go beyond that, but clearly we generally operate below that figure on most of them. Oftentimes the waste we pick up and remove we take to a treatment facility; we take to an offsite incinerator. We move forward with treatment of that waste or we take it clearly on an offsite policy that Congress incorporated into the law that was very stringent for a land disposal facility that is a stringently monitored facility.

It's moving something from an uncontrolled situation presents a threat to a controlled situation that doesn't present a threat. The removal program, many people often think, is a program that somehow is a temporary fix, but in the majority of cases that's not the case at all. They are often looking at something that is a significant improvement, significant cleanup.

Mr. CLINGER. With regard to the issue of personnel resources, I've heard reports of difficulty in terms of recruitment and, more importantly, retention of qualified personnel in the program. I think you have defended that today and indicated that at the senior levels you have some very, very qualified, competent people in place.

But I guess the question would be: where the cleanup project managers have been there for a while, have developed an expertise, do you then have a risk that they are hired away by cleanup contractors or potentially responsible parties when they reach a level of experience that makes them attractive to industry? If so, is there a potential conflict there in their dealing with these people, that there might be a risk that they go easier than they might otherwise go?

Mr. THOMAS. There is no question that that turnover is an issue, and an issue that is a difficult one from a management point of view. There's also no question when you increase the size of your staff as rapidly as we have over the last couple of years, you end up with a good many junior people, as you look at new employees coming in.

It is not totally unlike other programs, though. The construction grant program, which was a big program that the agency managed, I think you saw the same kind of turnover. You saw people who came into EPA as engineers, learned the Government process, managed site cleanup, and then were very attractive to the other side, which is contractors who, in fact, were building waste water treatment facilities.

You see that in Superfund. One of the problems we face is that's one of the things you have when you've got a big program like this, particularly when you've got as much cleanup going on other than Superfund as what's under Superfund. You've got a lot of people out there in the private side who look to the people in EPA as people who are very attractive and who, frankly, they can pay a lot more money and offer benefits.

One of the issues we deal with all the time in Government is the fact that we still haven't come to grips with the fact that we're going to have to deal with the overall pay situation with some of our employees if we're going to continue to attract them and keep them, and we've got to deal with the benefit situation if we're going to continue to keep them. That's one of the things we face in this program—the private sector can often offer more in terms of pay and benefits.

They look to our people. They are attractive. I must say, though, that an awful lot of our people continue, maintain the kind of knowledge that they gain, go up through our system, and then become our senior managers. There is a very strong senior management core when you look at Superfund and our cleanup program.

Finally, I would say the fact that an EPA person goes to work for a contractor who is cleaning up Superfund sites is not all bad. As a matter of fact, it may be very good. That is, you end up with well-trained people who are working for contractors cleaning up Superfund sites with the same kind of objective in mind that they had over on the Government side, which was to look for good remedies, move forward and try to get the remedies implemented properly.

While we may be a training ground, it may not be all bad from a public policy point of view that, in fact, that's what happens.

Mr. CLINGER. Thank you, Mr. Chairman.

Mr. OBERSTAR. Mr. Thomas, before I go on to the gentleman from Pennsylvania, one question: do you have a definition of permanent in this context of permanent removal, permanent destruction in the agency? I mean a technical understanding.

Mr. Porter.

Mr. PORTER. Mr. Chairman, we have debated that a lot. I guess I would say two things. First, the way I am looking at permanent is to permanently protect human health and the environment. That's No. 1.

But then I need to qualify that by saying the law also says things like treatment to the maximum extent practicable, reduced toxicity, mobility, and volume. So you have to caveat it with those factors.

We have not come with a simple definition. Let me tell you some things real quickly that are just as important.

We don't consider permanent to mean you dig everything up at every site and burn it or you totally destroy every chemical or every smidgen of chemical at every site—for three reasons: one, you can, in a sense, produce more harm by doing that. No. 2, you'd need a much bigger fund than we have to accomplish that. No. 3, it is just not the right way to go always.

Frankly, when the law first passed we had a problem in the agency where we all thought, the answer for a remedy to be totally permanent was to burn everything. That's permanent. We would all agree that's permanent.

But we began to say that would be about six sites a year with our $800 or $900 million to do that. Second, a lot of communities didn't want incinerators. A lot of States didn't want to pay the 10 percent for a $100 million incinerator, and so on.

So permanent is not, in my judgment, that you just burn everything at every site. It's permanent protection of human health and the environment. It's minimizing the long-term maintenance kind of things you've got to do to maximize treatment, to reduce toxicity, mobility, and volume, and those kinds of other statutory provisions.

It's not a really simple thing to define. We'd sure be very interested in your input on that as to whether we should have a simple definition or the more complex one I've just explained.

Mr. OBERSTAR. Well, "permanent" could take many forms. I wanted to get your direction. I won't take the time of other members, but I want you to think about permanent when you use words like encapsulation, vitrification, scaling off sites, and then the consequences for groundwater. Does permanent mean permanently removed from any potential groundwater contamination?

The Chair recognizes the gentleman from Pennsylvania, Mr. Kolter.

Mr. **Kolter**. Thank you, Mr. Chairman.

Mr. Thomas and panel, I'm delighted to see you here this morning for many reasons. First off, on a personal note, I'm going to ask you just one question relative to a site in my district considered the worst in Pennsylvania, the Bruin Lagoon in Butler County, western Pennsylvania.

However, before that, I would like to thank your staff and the people at the EPA for the number of times that I and my office have called and contacted your people on a number of sites we have in Pennsylvania. Coming from Pennsylvania, we have a great number of manufacturing sites and, of course, the residue ends up in toxic waste and eventually toxic sites. Your people have been most helpful to ease the concerns of our taxpayers.

The one question I have again is relative to the Bruin Lagoon. The cleanup started many years ago and then it stopped. Then after SARA, last year it started again. In my understanding, permanent cleanup procedures are being utilized.

Could I have something in writing from your people to further clarify precisely what is going on in this area, so I can be more definitive with my taxpayers and the people of western Pennsylvania?

Mr. **Thomas**. We'd be pleased to do that, Mr. Kolter. We'll provide you and the committee, if the chairman would like, a response as to exactly what the status is and the projections of work at Bruin Lagoon.

Mr. **Kolter**. Thank you very kindly, Mr. Thomas.

Mr. **Thomas**. You're quite welcome.

[The following was received from Mr. Thomas:]

BRUIN LAGOON, PA

The Bruin Lagoon is an abandoned waste oil lagoon. The lagoon currently contains approximately 17,000 cubic years of unstabilized sulfuric acid sludge. A remedial assessment was started several years ago. During the sludge stabilization operation, the contractor broke through a crust layer, released sulfuric acid mists and exposed additional sludge layers.

The Corps of Engineers is having GAI Consultants of Pittsburg, Pennsylvania design a sludge stabilization process and a cap for the area. The sludge will be stabilized by mixing it with soil and hydrated lime and placing it back in the Lagoon. The entire area will then be covered by a RCRA cap. A 60 percent design review was held on May 4-6, 1988. The 95 percent design submittal is due in mid-June 1988. The remedial action is scheduled to be bid and awarded this summer.

Mr. **Oberstar**. The gentlewoman from Connecticut, Mrs. Johnson?

Mrs. **Johnson**. Mr. Chairman, our colleague, Mrs. Bentley, has to leave. Both Mr. Gallo and I have agreed that she could go next.

Mr. **Oberstar**. The Chair recognizes the gentlewoman from Maryland.

Mrs. **Bentley**. I want to thank Mrs. Johnson and Mr. Gallo for allowing me to go ahead of them.

I just want to discuss one thing with you, Mr. Thomas. I might say that when you are criticized on both sides, one that you're working too fast and the other that you're working too slowly, that means that maybe you're progressing at a pretty good pace. I hope down the road we all feel that way.

Last week in the Baltimore area—this was not in my district; it was in Mr. Cardin's district—in the Baltimore area we had a bad fire. Adjacent to that is a plant, Allied Chemical Plant, which has been closed down for some time now.

I know that the EPA has been working with the Department of Environment in Maryland and Allied Chemical to see about getting this cleaned up. I am assuming that it's not under the so-called Superfund legislation because Allied Chemical is going to pay for it, but it is under pressure, I hope.

Are you familiar with that?

Mr. **Thomas**. Not fully, but I have had some information on it. That is not an unusual situation for EPA to be involved in. Where there is a fire, it may involve release of toxic substances or it may be chemical substances involved.

Our personnel who work in our removal program who are our spill response personnel and our onsite personnel often work with State authorities to insure that that response is carried out properly if it's by us, the State authority, or by the responsible party. In this case if it's being carried out by Allied, we'll oversee how they're doing it. We'll insure that we feel comfortable with what's going on and support the State in doing their job. If necessary, we do have the authority under the Superfund program to actually expend money and then get it back from the responsible party, if necessary.

My understanding is in this case EPA out of our Philadelphia region is working actively with the State in dealing with that situation.

Mrs. **Bentley**. I understand they are.

Our great concern, of course, is if that should go up in flames, which could happen because there have been a lot of empty warehouses that go up in the area, that could emit the asbestos and the chrome into the air, and also into Chesapeake Bay. It really creates quite a problem.

Mr. **Thomas**. Clearly, those are the concerns that all of us would have. Those are exactly the kinds of things that our people are trained to deal with, those kinds of situations, and deal with all over the country.

Mrs. **Bentley**. Well, I want to thank you and your staff for what they are doing.

Again, I want to thank my two colleagues for letting me go ahead. Thank you.

Thank you, Mr. Chairman. I have a prepared statement for the record.

[Mrs. Bentley's prepared statement follows:]

PREPARED STATEMENT OF HON. HELEN DELICH BENTLEY

Chairman Oberstar and Ranking Republican Member, Mr. Clinger, I commend both of you for calling the Subcommittee on Investigations and Oversight together this morning to closely examine the progress that has been achieved under the Superfund Act by the federal government. Today we will hear from the Administrator of the U.S. Environmental Protection Agency (EPA), our colleague, Senator Lautenberg and the Project Director from the Office of Technology Assessment (OTA) on the preliminary findings from the Superfund implementation study.

Oversight hearings such as this one are critically important to the successful implementation of legislation prepared by the Committee on Public Works and Transportation, passed by Congress and signed into law. Reauthorization of the Superfund legislation was a significant accomplishment by the 99th Congress. I am proud to say that this committee played a major role in contributing to the preparation and final passing of this important environmental legislation.

It is in the best interest of all parties involved in Superfund implementation that this subcommittee continue to monitor EPA's early decisions made in regard to removal and subsequent remedial cleanup of Superfund sites. Today's hearing is well in advance of the 1991 expiration date of the $8.5 billion Superfund authorization. Therefore, careful review of Superfund implementation will stimulate necessary corrections to any problems that may arise.

Since my first election to Congress, I have been a strong supporter of legislation needed to address our nation's hazardous and toxic sites. It was only last week that a large fire occurred near my home congressional district in Maryland. The Fells Point fire caused some $10 million worth of damage and spilled oil and grease into the Chesapeake Bay. I mention this fire because the nearly vacant Allied Chemical Company which is heavily contaminated with chrome ore and asbestos, was saved from the fire only by the hard work of the firefighters. If the Allied facility had burned, chrome particles not only would have been released into the air, endangering those who inhaled the smoke, but also into the Patapsco River and thus ultimately into the Chesapeake Bay.

The Philadelphia office of the EPA has advised my office that it is working with both Maryland's Department of Environment and Allied Chemical, which will foot the bill, to have this area located right on Baltimore's waterfront cleaned up. I urge EPA to pressure a speed up of this process so that the plant can be torn down and the area safely cleaned up and encased, if that is the way to go, before it too should catch on fire. Meantime, I offer my full support to working with this subcommittee to achieve successful implementation of the Superfund Act.

Mr. OBERSTAR. Thank you.

The Chair recognizes the gentleman from Georgia.

Mr. ROWLAND. Thank you, Mr. Chairman.

Thank you, Mr. Thomas, for what you are doing in progressing with this because it looked at one time as though we were not going to get any cleanup done.

Let me ask you about the problem of liability. That was one of the stumbling blocks that was encountered early. We could not even get the engineering done much less get someone to clean up the hazardous material. Where do we stand now with reference to liability?

Mr. THOMAS. As you say, Mr. Rowland, during reauthorization the issue of strict, joint and several liability was debated, and particularly in the context of contractors who were trying to work for us or work for responsible parties. You gave us the authority for indemnification, both for our contractors and for contractors who were working in responsible party sites where we had settlements. We have moved forward with that authority. In fact, we are expanding the number of contractors that we have substantially. We find a large number of qualified contractors who want to do the work, are doing the work, and are doing it with the kind of authority that you gave us to assure that we are dealing with their concerns about liability.

Win, you may want to add to that.

Mr. PORTER. May I just add one thing to that, Congressman?

We're writing new regulations pursuant to the law on the exact limits of deductibles and those sorts of things that we can use to indemnify contractors. We can at least partially indemnify them.

As you perhaps recall from the debate on reauthorization, we cannot pre-empt States. They don't have this indemnification with respect to State law.

People still have a problem out there on liability. That's the bad news. The good news, I guess, is that, as Lee indicated, we're getting a lot of people who want to work at this program, that are making arrangements for insurance through a variety of means.

We recently had, for example, 85 engineering firms bid on a procurement of some 8 or 10 projects. We are not being able totally to handle people's indemnification problems, but, on the other hand, people seem to be able to work on the program. I think competition is driving a lot of this.

Mr. ROWLAND. So the insurance is obtainable now and the premiums are not prohibitive, I assume?

Mr. THOMAS. I wouldn't say that.

Mr. PORTER. I wouldn't go that far.

Mr. THOMAS. Insurance, environmental impairment liability insurance I think is pretty scarce. What we are finding is, I think, that they are able to find some types of insurance. Our indemnification, even though it's Federal and not State law, is still an extremely important component of insuring the contractor's workplace. I think if we didn't have the authority that you gave us in the law, we would be in very, very bad trouble in trying to find people to do this work.

Mr. ROWLAND. One point that was debated was how clean is clean, and I guess that's what we're talking about, permanent cleanup, too. Where are we with reference to how clean is clean?

Mr. THOMAS. That's been a debate since the program started back in 1981, as you recall. This time you refined the definition somewhat. That's where we got into the whole issue of permanence, we got into the whole issue of compliance with State regulations as well as other regulations.

I think we have gone forward with the refined definition fairly well, and it really does boil down to compliance with all of the standards under other laws like the drinking water standards, air standards, compliance with State requirements except in limited situations. That basically defines what that remedy is going to be in most cases.

Incorporate in that, then, your overall goal of permanence, which is long-term protection of public health and the environment, and out of that kind of process you then get a definition of how clean is clean site by site. That's how you do it.

Mr. ROWLAND. Thank you very much.

Thank you, Mr. Chairman.

Mr. OBERSTAR. The Chair recognizes the gentleman from New Jersey, Mr. Gallo.

Mr. GALLO. Thank you, Mr. Chairman.

I would also like to thank my colleague, Mrs. Johnson, for allowing me to go before her.

Although I am not a member of this subcommittee, but certainly as someone that is very concerned about what's transpiring in the Superfund program time and again I have heard the statement made that actually there has not been one cleanup completed to date. Is that a factual statement?

Mr. **Thomas**. Under the Superfund program, that's absolutely not a factual statement. Over on the Priority List sites, we have completed and deleted 13 sites, I believe, and 12 more are in the process at being deleted.

Under the removal program, over 1,000 we have dealt with. Many of those are sites that never got on the Priority List because we completed them. There has been an awful lot of sites where we have completed work.

Mr. **Gallo**. For my edification, could I have a copy of those sites——

Mr. **Thomas**. We would be pleased to do so. I think the ones that you are probably most interested in are the ones that are on the National Priority List.

Mr. **Gallo**. Correct.

Mr. **Thomas**. Those are the ones that people really focus on. We would be glad to give you a copy.

[The following was received from Mr. Thomas:]

Insert page 65, line 1570

National Priorities List,
Final and Proposed Sites (by State)
July 1987

St	Site Name	City/County	Date		Rank/ Group[2]	Response Category[3]	Cleanup Status[4]
			Proposed or Announced[1]	Final			
AZ	Hassayampa Landfill	Hassayampa	6/86	7/87	310	D	
AZ	Indian Bend Wash Area	Scottsdale/Tmpe/Phnx	12/82	9/83	340	V F	
AZ	Litchfield Airport Area	Goodyear/Avondale	12/82	9/83	254	F	
AZ	Mesa Area Ground Water Contamin	Mesa	6/86		Gr 13	D	
AZ	Motorola, Inc.(52nd Street Plant)	Phoenix	10/84		Gr 8	D	
AZ	Mountain View Mobile Homes *	Globe	7/82	9/83	94	R F	C
AZ	Nineteenth Avenue Landfill	Phoenix	10/81	9/83	116	S	
AZ	Tucson Intl Airport Area	Tucson	7/82	9/83	70	R	
	6 Final + 3 Proposed = 9 Total Sites						
CA	Advanced Micro Devices, Inc.	Sunnyvale	10/84	6/86	447	D	
CA	Aerojet General Corp.	Rancho Cordova	10/81	9/83	110	F	I
CA	Applied Materials	Santa Clara	10/84	7/87	659	D	O
CA	Atlas Asbestos Mine	Fresno County	9/83	9/84	259	R	
CA	Beckman Instruments (Porterville)	Porterville	10/84	6/86	568	D	
CA	Castle Air Force Base	Merced	10/84	7/87	Gr 9F	R	I
CA	Celtor Chemical Works	Hoopa	12/82	9/83	714	R	O
CA	Coalinga Asbestos Mine	Coalinga	9/83	9/84	260	R	
CA	Coast Wood Preserving	Ukiah	12/82	9/83	275	S	
CA	Del Norte Pesticide Storage	Crescent City	9/83	9/84	496	R	
CA	Fairchild Camera (Mountain View)	Mountain View	10/84		Gr 14	F	
CA	Fairchild Camera(S San Jose Plnt)	South San Jose	10/84		Gr 9	D	I
CA	Firestone Tire (Salinas Plant)	Salinas	10/84	7/87	255	S	O
CA	FMC Corp. (Fresno Plant)	Fresno	10/84		Gr 9	D	
CA	Hewlett-Packard	Palo Alto	10/84		Gr 15	D	
CA	IBM Corp. (San Jose Plant)	San Jose	10/84		Gr 16	D	I
CA	Intel Corp. (Mountain View Plant)	Mountain View	10/84	6/86	732	F	
CA	Intel Corp. (Santa Clara III)	Santa Clara	10/84	6/86	661	D	
CA	Intel Magnetics	Santa Clara	10/84	6/86	660	D	
CA	Iron Mountain Mine	Redding	10/81	9/83	73	R	
CA	J.H. Baxter Co.	Weed	10/84		Gr 11	D	
CA	Jibboom Junkyard	Sacramento	12/82	9/83	749	R	
CA	Koppers Co.,Inc. (Oroville Plant)	Oroville	9/83	9/84	599	S	
CA	Lawrence Livermore Lab (USDOE)	Livermore	10/84	7/87	Gr 7F	R	O
CA	Liquid Gold Oil Corp.	Richmond	12/82	9/83	296	S	
CA	Lorentz Barrel & Drum Co.	San Jose	10/84		Gr 12	S	
CA	Louisiana-Pacific Corp.	Oroville	10/84	6/86	600	D	
CA	Marley Cooling Tower Co.	Stockton	10/84		Gr 13	D	
CA	Mather AFB (AC&W Disposal Site)	Sacramento	10/84	7/87	Gr 16F	R	
CA	McClellan AFB (Ground Water Cont)	Sacramento	10/84	7/87	Gr 2F	R	O
CA	McColl	Fullerton	12/82	9/83	353	R F	I

National Priorities List,
Final and Proposed Sites (by State)
July 1987

			Date				
St	Site Name	City/County	Proposed or Announced$_1$	Final	Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
CA	MGM Brakes	Cloverdale	12/82	9/83	549	S	
CA	Moffett Naval Air Station	Sunnyvale	4/85	7/87	Gr 15F	R	
CA	Monolithic Memories	Sunnyvale	10/84	7/87	515	D	
CA	Montrose Chemical Corp.	Torrance	10/84		Gr 12	F	
CA	National Semiconductor Corp.	Santa Clara	10/84	7/87	516	D	
CA	Norton Air Force Base	San Bernardino	10/84	7/87	Gr 9F	R	
CA	Operating Industries, Inc. Lndfil	Monterey Park	10/84	6/86	71	F	
CA	Purity Oil Sales, Inc.	Malaga	12/82	9/83	297	R	O
CA	Raytheon Corp.	Mountain View	10/84	6/86	733	F	I
CA	Rhone-Poulenc, Inc./Zoecon Corp.	East Palo Alto	10/84		Gr 14	S	
CA	S.CA Edison (Visalia Poleyard)	Visalia	1/87		Gr 3	D	
CA	Sacramento Army Depot	Sacramento	10/84	7/87	Gr 6F	R	
CA	San Fernando Valley (Area 1)	Los Angeles	10/84	6/86	343	D	
CA	San Fernando Valley (Area 2)	Los Angeles/Glendale	10/84	6/86	344	D	
CA	San Fernando Valley (Area 3)	Glendale	10/84	6/86	345	D	
CA	San Fernando Valley (Area 4)	Los Angeles	10/84	6/86	514	D	
CA	San Gabriel Valley (Area 1)	El Monte	9/83	5/84	341	R	I
CA	San Gabriel Valley (Area 2)	Baldwin Park Area	9/83	5/84	342	R	
CA	San Gabriel Valley (Area 3)	Alhambra	9/83	5/84	756	R	
CA	San Gabriel Valley (Area 4)	La Puente	9/83	5/84	757	R	
CA	Selma Treating Co.	Selma	12/82	9/83	195	F	
CA	Sharpe Army Depot	Lathrop	10/84	7/87	Gr 7F	R	O
CA	Signetics, Inc.	Sunnyvale	10/84		Gr 14	D	
CA	South Bay Asbestos Area	Alviso	10/84	6/86	276	R	I
CA	Southern Pacific Transportation	Roseville	10/84		Gr 14	F	
CA	Stringfellow *	Glen Avon Heights	10/81	9/83	32	R F	O
CA	T.H. Agriculture & Nutrition Co.	Fresno	10/84	6/86	346	D	
CA	Teledyne Semiconductor	Mountain View	10/84	7/87	528	D	
CA	Van Waters & Rogers, Inc.	San Jose	10/84		Gr 3	D	
CA	Waste Disposal, Inc.	Santa Fe Springs	6/86	7/87	555	D	
CA	Watkins-Johnson Co. (Stewart Div)	Scotts Valley	1/87		Gr 6	S	I
CA	Westinghouse (Sunnyvale Plant)	Sunnyvale	10/84	6/86	393	D	
	48 Final + 15 Proposed = 63 Total Sites						
CO	Broderick Wood Products	Denver	9/83	9/84	534	V F	
CO	California Gulch	Leadville	12/82	9/83	75	F	
CO	Central City-Clear Creek	Idaho Springs	7/82	9/83	157	R	
CO	Denver Radium Site	Denver	10/81	9/83	284	R	I
CO	Eagle Mine	Minturn/Redcliff	10/84	6/86	221	R S	O
CO	Lincoln Park	Canon City	9/83	9/84	678	F	
CO	Lowry Landfill	Arapahoe County	9/83	9/84	201	V R	O

National Priorities List,
Final and Proposed Sites (by State)
July 1987

St	Site Name	City/County	Date Proposed or Announced$_1$	Date Final	Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
CO	Marshall Landfill *	Boulder County	7/82	9/83	85	F	O
CO	Martin Marietta(Denver Aerospace)	Waterton	9/85		Gr 5	F S	
CO	Rocky Flats Plant (USDOE)	Golden	10/84		Gr 1F	R	O
CO	Rocky Mountain Arsenal	Adams County	10/84	7/87	Gr 2F	R	O
CO	Sand Creek Industrial	Commerce City	12/82	9/83	36	R F	O
CO	Smuggler Mountain	Pitkin County	10/84	6/86	679	V F	
CO	Uravan Uranium (Union Carbide)	Uravan	10/84	6/86	292	D	
CO	Woodbury Chemical Co.	Commerce City	7/82	9/83	270	R	
	13 Final + 2 Proposed = 15 Total Sites						
CT	Beacon Heights Landfill	Beacon Falls	12/82	9/83	229	R	
CT	Kellogg-Deering Well Field	Norwalk	9/83	9/84	394	R	
CT	Laurel Park, Inc. *	Naugatuck Borough	10/81	9/83	84	V S	
CT	Nutmeg Valley Road	Wolcott	1/87		Gr 7	D	
CT	Old Southington Landfill	Southington	9/83	9/84	114	S	
CT	Revere Textile Prints Corp.	Sterling	6/86	7/87	362	D	
CT	Solvents Recovery Service	Southington	12/82	9/83	269	F	I
CT	Yaworski Waste Lagoon	Canterbury	12/82	9/83	476	R S	
	7 Final + 1 Proposed = 8 Total Sites						
DE	Army Creek Landfill	New Castle County	10/81	9/83	9	V R F	O
DE	Chem-Solv, Inc.	Cheswold	1/87		Gr 9	R	O
DE	Coker's Sanitation Service Lfs	Kent County	4/85	7/87	143	D	
DE	Delaware City PVC Plant	Delaware City	10/81	9/83	707	V F	
DE	Delaware Sand & Gravel Landfill	New Castle County	10/81	9/83	236	R	O
DE	Dover Air Force Base	Dover	10/84		Gr 10F	R	I
DE	Dover Gas Light Co.	Dover	1/87		Gr 7	D	
DE	E.I. Du Pont (Newport Plant Lf)	Newport	1/87		Gr 4	D	
DE	Halby Chemical Co.	New Castle	9/85	6/86	695	F	
DE	Harvey & Knott Drum, Inc.	Kirkwood	7/82	9/83	696	R	O
DE	NCR Corp. (Millsboro Plant)	Millsboro	4/85	7/87	426	D	
DE	New Castle Spill	New Castle County	12/82	9/83	424	D	
DE	New Castle Steel	New Castle County	12/82	9/83	710	D	
DE	Pigeon Point Landfill	New Castle	1/87		Gr 9	D	
DE	Standard Chlorine of Delaware,Inc	Delaware City	9/85	7/87	521	D	
DE	Tybouts Corner Landfill *	New Castle County	10/81	9/83	2	V R F	O
DE	Tyler Refrigeration Pit	Smyrna	6/86		Gr 15	D	
DE	Wildcat Landfill	Dover	12/82	9/83	703	R	
	12 Final + 6 Proposed = 18 Total Sites						
FL	Alpha Chemical Corp.	Galloway	10/81	9/83	299	V	

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St	Site Name	City/County	Date: Proposed or Announced$_1$	Date: Final	Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
FL	American Creosote (Pensacola Plt)	Pensacola	10/81	9/83	50	R F	O
FL	Brown Wood Preserving	Live Oak	12/82	9/83	261	V F	
FL	Cabot/Koppers	Gainesville	9/83	9/84	478	R F S	O
FL	City Industries, Inc.	Orlando	10/84		Gr 14	R F S	O
FL	Coleman-Evans Wood Preserving Co.	Whitehouse	10/81	9/83	245	R F S	O
FL	Davie Landfill	Davie	10/81	9/83	65	V R F S	I
FL	Dubose Oil Products Co.	Cantonment	10/84	6/86	569	S	O
FL	Florida Steel Corp.	Indiantown	12/82	9/83	250	V	O
FL	Gold Coast Oil Corp.	Miami	10/81	9/83	67	R	O
FL	Harris Corp. (Palm Bay Plant)	Palm Bay	4/85	7/87	509	V S	O
FL	Hipps Road Landfill	Duval County	9/83	9/84	656	V R F	O
FL	Hollingsworth Solderless Terminal	Fort Lauderdale	10/81	9/83	278	R	I
FL	Kassauf-Kimerling Battery	Tampa	10/81	9/83	127	V R S	I
FL	Miami Drum Services	Miami	10/81	9/83	122	R F	O
FL	Montco Research Products, Inc.	Hollister	10/84		Gr 15	R S	
FL	Munisport Landfill	North Miami	12/82	9/83	636	F	
FL	NW 58th Street Landfill	Hialeah	10/81	9/83	181	V R F S	I
FL	Parramore Surplus	Mount Pleasant	12/82	9/83	455	D	O
FL	Peak Oil Co./Bay Drum Co.	Tampa	10/84	6/86	53	R	
FL	Pepper Steel & Alloys, Inc.	Medley	9/83	9/84	662	R F	O
FL	Petroleum Products Corp.	Pembroke Park	4/85	7/87	386	V F S	O
FL	Pickettville Road Landfill	Jacksonville	10/81	9/83	303	V F	I
FL	Pioneer Sand Co.	Warrington	10/81	9/83	148	R S	
FL	Piper Aircraft/Vero Beach Wtr&Swr	Vero Beach	6/86		Gr 14	D	O
FL	Pratt & Whitney Air/United Tech	West Palm Beach	9/85		Gr 13	V S	O
FL	Reeves SE Galvanizing Corp.	Tampa	10/81	9/83	45	D	O
FL	Sapp Battery Salvage	Cottondale	10/81	9/83	210	R	O
FL	Schuylkill Metals Corp.	Plant City	12/82	9/83	40	D	O
FL	Sherwood Medical Industries	Deland	12/82	9/83	399	D	
FL	Sixty-Second Street Dump	Tampa	12/82	9/83	186	R	I
FL	Sydney Mine Sludge Ponds	Brandon	6/86		Gr 9	D	O
FL	Taylor Road Landfill	Seffner	10/81	9/83	159	V F	O
FL	Tower Chemical Co.	Clermont	10/81	9/83	286	R F	O
FL	Tri-City Oil Conservationist, Inc	Tampa	9/83	9/84	408	R F S	O
FL	Varsol Spill	Miami	10/81	9/83	280	R	I
FL	Whitehouse Oil Pits	Whitehouse	10/81	9/83	137	R	O
FL	Yellow Water Road Dump	Baldwin	9/85	6/86	719	V R F	O
FL	Zellwood Ground Water Contamin	Zellwood	10/81	9/83	152	F	I
	34 Final + 5 Proposed = 39 Total Sites						
GA	Diamond Shamrock Corp. Landfill	Cedartown	1/87		Gr 11	D	

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St	Site Name	City/County	Date: Proposed or Announced[1]	Date: Final	Rank/ Group[2]	Response Category[3]	Cleanup Status[4]
GA	Hercules 009 Landfill	Brunswick	9/83	9/84	138	D	
GA	Mathis Bros Lf (S Marble Top Rd)	Kensington	1/87		Gr 14	D	
GA	Monsanto Corp. (Augusta Plant)	Augusta	9/83	9/84	500	V S	O
GA	Olin Corp. (Areas 1,2 & 4)	Augusta	9/83		Gr 5	S	
GA	Powersville Site	Peach County	9/83	9/84	517	R F	
GA	Robins AFB (Lndfll #4/Sludge Lag)	Houston County	10/84	7/87	Gr 4F	R	
	4 Final + 3 Proposed = 7 Total Sites						
GU	Ordot Landfill *	Guam	10/81	9/83	97	R	
	1 Final + 0 Proposed = 1 Total Sites						
HI	Kunia Wells I	Oahu	10/84		Gr 9	D	
HI	Kunia Wells II	Oahu	10/84		Gr 9	D	
HI	Mililani Wells	Oahu	10/84		Gr 7	D	
HI	Waiawa Shaft	Oahu	10/84		Gr 7	D	
HI	Waipahu Wells	Oahu	10/84		Gr 9	D	
HI	Waipio Heights Wells II	Oahu	10/84		Gr 11	D	
	0 Final + 6 Proposed = 6 Total Sites						
IA	A.Y. McDonald Industries, Inc.	Dubuque	9/85		Gr 6	F	
IA	Aidex Corp. *	Council Bluffs	10/81	9/83	93	R	O
IA	Chemplex Co.	Clinton/Camanche	10/84		Gr 3	D	O
IA	Des Moines TCE	Des Moines	12/82	9/83	331	R	I
IA	Frit Industries (Humboldt Plant)	Humboldt	4/85		Gr 4	S	
IA	John Deere (Dubuque Works)	Dubuque	9/85		Gr 11	D	
IA	LaBounty Site	Charles City	12/82	9/83	8	V F	O
IA	Lawrence Todtz Farm	Camanche	9/85	6/86	146	D	
IA	Midwest Manufacturing/North Farm	Kellogg	9/85	6/86	649	D	
IA	Red Oak City Landfill	Red Oak	6/86		Gr 12	D	
IA	Shaw Avenue Dump	Charles City	9/85	7/87	726	D	
IA	U.S. Nameplate Co.	Mount Vernon	10/84		Gr 14	D	
IA	Vogel Paint & Wax Co.	Orange City	10/84	6/86	673	S	
	7 Final + 6 Proposed = 13 Total Sites						
ID	Arrcom (Drexler Enterprises)	Rathdrum	12/82	9/83	746	R	
ID	Bunker Hill Mining & Metallurg	Smelterville	12/82	9/83	107	F S	
ID	Pacific Hide & Fur Recycling Co.	Pocatello	9/83	9/84	330	F	O
ID	Union Pacific Railroad Co.	Pocatello	9/83	9/84	124	D	

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4 Final + 0 Proposed = 4 Total Sites

St	Site Name	City/County	Date: Proposed or Announced[1]	Date: Final	Rank/ Group[2]	Response Category[3]	Cleanup Status[4]
IL	A & F Material Reclaiming, Inc.	Greenup	7/82	9/83	102	F	O
IL	Acme Solvent (Morristown Plant)	Morristown	7/82	9/83	652	V R	I
IL	Belvidere Municipal Landfill	Belvidere	12/82	9/83	768	R	I
IL	Byron Salvage Yard	Byron	12/82	9/83	582	R	I
IL	Cross Brothers Pail (Pembroke)	Pembroke Township	12/82	9/83	349	R	I
IL	Galesburg/Koppers Co.	Galesburg	12/82	9/83	546	S	
IL	H.O.D. Landfill	Antioch	9/85		Gr 3	S	
IL	Johns-Manville Corp.	Waukegan	12/82	9/83	428	F	
IL	Joliet Army Ammu Plant (LAP Area)	Joliet	4/85		Gr 11F	R	
IL	Joliet Army Ammu Plant (Mfg Area)	Joliet	10/84	7/87	Gr 13F	R	O
IL	Kerr-McGee (Kress Creek)	DuPage County	10/84		Gr 9	D	
IL	Kerr-McGee (Reed-Keppler Park)	West Chicago	10/84		Gr 9	D	
IL	Kerr-McGee (Residential Areas)	W Chic/DuPage Cnty	10/84		Gr 9	D	
IL	Kerr-McGee (Sewage Treat Plant)	West Chicago	10/84		Gr 11	D	
IL	LaSalle Electric Utilities	LaSalle	12/82	9/83	348	R	I
IL	NL Industries/Taracorp Lead Smelt	Granite City	10/84	6/86	433	V F S	
IL	Outboard Marine Corp. *	Waukegan	10/81	9/83	86	R F	
IL	Pagel's Pit	Rockford	10/84	6/86	251	D	O
IL	Parsons Casket Hardware Co.	Belvidere	1/87	7/87	101	D	
IL	Petersen Sand & Gravel	Libertyville	10/84	6/86	421	R	
IL	Sangamo/Crab Orchard NWR (USDOI)	Carterville	10/84	7/87	Gr 6F	R	
IL	Savanna Army Depot Activity	Savanna	10/84		Gr 7F	R	
IL	Sheffield (U.S. Ecology, Inc.)	Sheffield	10/84		Gr 15	F	
IL	Stauffer Chem (Chic Heights Plnt)	Chicago Heights	1/87		Gr 14	D	
IL	Tri-County Lf/Waste Mgmt Illinois	South Elgin	6/86		Gr 7	D	
IL	Velsicol Chemical (Illinois)	Marshall	12/82	9/83	197	R	C
IL	Wauconda Sand & Gravel	Wauconda	7/82	9/83	128	R	

17 Final + 10 Proposed = 27 Total Sites

St	Site Name	City/County	Date: Proposed or Announced[1]	Date: Final	Rank/ Group[2]	Response Category[3]	Cleanup Status[4]
IN	American Chemical Service, Inc.	Griffith	9/83	9/84	540	F	
IN	Bennett Stone Quarry	Bloomington	9/83	9/84	634	V F	O
IN	Columbus Old Municipal Lndfll #1	Columbus	9/85	6/86	263	D	
IN	Douglass Road/Uniroyal, Inc., Lf	Mishawaka	6/86		Gr 7	D	
IN	Envirochem Corp.	Zionsville	12/82	9/83	240	V R F	O
IN	Firestone Industrial Products Co.	Noblesville	9/85		Gr 15	D	
IN	Fisher-Calo	LaPorte	12/82	9/83	147	F	
IN	Fort Wayne Reduction Dump	Fort Wayne	10/84	6/86	323	R	
IN	International Minerals (E. Plant)	Terre Haute	10/84	6/86	68	D	

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St	Site Name	City/County	Date		Rank/ Group[2]	Response Category[3]	Cleanup Status[4]
			Proposed or Announced[1]	Final			
IN	Lake Sandy Jo (M&M Landfill)	Gary	12/82	9/83	427	R	
IN	Lemon Lane Landfill	Bloomington	12/82	9/83	744	V F	I
IN	Main Street Well Field	Elkhart	12/82	9/83	319	R	
IN	Marion (Bragg) Dump	Marion	12/82	9/83	530	R	
IN	McCarty's Bald Knob Landfill	Mt. Vernon	1/87		Gr 11	D	
IN	MIDCO I	Gary	12/82	9/83	241	F	O
IN	MIDCO II	Gary	10/84	6/86	723	V R F	O
IN	Neal's Dump (Spencer)	Spencer	10/84	6/86	485	F S	O
IN	Neal's Landfill (Bloomington)	Bloomington	10/81	9/83	307	V F	
IN	Ninth Avenue Dump	Gary	12/82	9/83	381	R	
IN	Northside Sanitary Landfill, Inc	Zionsville	9/83	9/84	249	F S	
IN	Poer Farm	Hancock County	9/83	9/84	458	R F	O
IN	Prestolite Battery Division	Vincennes	9/85		Gr 10	D	
IN	Reilly Tar (Indianapolis Plant)	Indianapolis	9/83	9/84	576	F	
IN	Seymour Recycling Corp. *	Seymour	10/81	9/83	57	V R F	O
IN	Southside Sanitary Landfill	Indianapolis	6/86		Gr 11	V S	
IN	Tri-State Plating	Columbus	9/85	6/86	745	D	
IN	Waste, Inc., Landfill	Michigan City	4/85	7/87	170	V F S	
IN	Wayne Waste Oil	Columbia City	12/82	9/83	328	R F	
IN	Wedzeb Enterprises, Inc.	Lebanon	12/82	9/83	680	F S	I
	24 Final + 5 Proposed = 29 Total Sites						
KS	Arkansas City Dump *	Arkansas City	10/81	9/83	100	R	
KS	Big River Sand Co.	Wichita	10/84	6/86	633	R	
KS	Cherokee County	Cherokee County	12/82	9/83	56	R	I
KS	Doepke Disposal (Holliday)	Johnson County	12/82	9/83	214	R	
KS	Johns' Sludge Pond	Wichita	12/82	9/83	494	V F	I
KS	National Industrial Environ Serv	Furley	10/84		Gr 9	F S	
KS	Obee Road	Hutchinson	1/87	7/87	613	D	
KS	Strother Field Industrial Park	Cowley County	10/84	6/86	612	V S	O
	7 Final + 1 Proposed = 8 Total Sites						
KY	A.L. Taylor (Valley of Drums) *	Brooks	10/81	9/83	96	R F	I
KY	Airco	Calvert City	12/82	9/84	619	V	I
KY	B.F. Goodrich	Calvert City	12/82	9/83	625	V	I
KY	Distler Brickyard	West Point	12/82	9/83	273	R F	O
KY	Distler Farm	Jefferson County	7/82	9/83	554	R F	O
KY	Howe Valley Landfill	Howe Valley	6/86	7/87	475	D	
KY	Lee's Lane Landfill	Louisville	7/82	9/83	405	V F	O
KY	Maxey Flats Nuclear Disposal	Hillsboro	10/84	6/86	668	V R F S	

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St	Site Name	City/County	Date		Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
			Proposed or Announced$_1$	Final			
KY	Newport Dump	Newport	12/82	9/83	453	R	
KY	Smith's Farm	Brooks	10/84	6/86	631	R	O
	10 Final + 0 Proposed = 10 Total Sites						
LA	Bayou Bonfouca	Slidell	12/82	9/83	731	R F	I
LA	Bayou Sorrel Site	Bayou Sorrel	7/82	9/84	550	F	
LA	Cleve Reber	Sorrento	12/82	9/83	196	R	I
LA	Combustion, Inc.	Denham Springs	6/86		Gr 12	S	
LA	Dutchtown Treatment Plant	Ascension Parish	1/87	7/87	487	D	
LA	Louisiana Army Ammunition Plant	Doyline	10/84		Gr 15F	R	
LA	Old Inger Oil Refinery *	Darrow	7/82	9/83	81	R	O
LA	Petro-Processors	Scotlandville	9/83	9/84	357	V F	
	6 Final + 2 Proposed = 8 Total Sites						
MA	Baird & McGuire	Holbrook	12/82	9/83	14	R F	O
MA	Cannon Engineering Corp. (CEC)	Bridgewater	12/82	9/83	395	R S	
MA	Charles-George Reclamation Lndfll	Tyngsborough	10/81	9/83	217	R F	O
MA	Groveland Wells	Groveland	12/82	9/83	368	V R S	
MA	Haverhill Municipal Landfill	Haverhill	10/84	6/86	715	D	
MA	Hocomonco Pond	Westborough	12/82	9/83	272	R	
MA	Industri-Plex	Woburn	10/81	9/83	5	V R	O
MA	Iron Horse Park	Billerica	9/83	9/84	305	R	O
MA	New Bedford Site *	New Bedford	7/82	9/83	80	V R F S	O
MA	Norwood PCBs	Norwood	10/84	6/86	741	R	O
MA	Nyanza Chemical Waste Dump	Ashland	10/81	9/83	11	R	
MA	Plymouth Harbor/Cannon Engnrng	Plymouth	12/82	9/83	106	V R S	O
MA	PSC Resources	Palmer	12/82	9/83	416	S	O
MA	Re-Solve, Inc.	Dartmouth	10/81	9/83	206	R F	I
MA	Rose Disposal Pit	Lanesboro	10/84	6/85	622	F S	
MA	Salem Acres	Salem	10/84	6/86	541	D	
MA	Shpack Landfill	Norton/Attleboro	10/84	6/86	739	D	
MA	Silresim Chemical Corp.	Lowell	7/82	9/83	311	R S	O
MA	Sullivan's Ledge	New Bedford	9/83	9/84	630	R F	
MA	W. R. Grace & Co. (Acton Plant)	Acton	12/82	9/83	38	V F S	O
MA	Wells G&H	Woburn	12/82	9/83	312	V F	
	21 Final + 0 Proposed = 21 Total Sites						
MD	Aber Prov Ground-Michaelsville Lf	Aberdeen	4/85		Gr 14F	R	
MD	Aberdeen Proving Ground-Edgewood	Edgewood	4/85		Gr 3F	R	

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			Date				
St	Site Name	City/County	Proposed or Announced$_1$	Final	Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
MD	Kane & Lombard Street Drums	Baltimore	10/84	6/86	724	R	O
MD	Limestone Road	Cumberland	12/82	9/83	708	R	O
MD	Mid-Atlantic Wood Preservers, Inc	Harmans	10/84	6/86	329	V F	
MD	Middletown Road Dump	Annapolis	12/82	9/83	742	R F	C
MD	Sand, Gravel & Stone	Elkton	12/82	9/83	361	V R F	O
MD	Southern Maryland Wood Treating	Hollywood	10/84	6/86	566	R	O
MD	Woodlawn County Landfill	Woodlawn	1/87	7/87	204	D	
	7 Final + 2 Proposed = 9 Total Sites						
ME	Brunswick Naval Air Station	Brunswick	10/84	7/87	Gr 6F	R	
ME	McKin Co.	Gray	12/82	9/83	33	R F S	O
ME	O'Connor Co.	Augusta	12/82	9/83	663	V R	
ME	Pinette's Salvage Yard	Washburn	12/82	9/83	577	R	O
ME	Saco Tannery Waste Pits	Saco	12/82	9/83	301	R	O
ME	Union Chemical Co., Inc.	South Hope	4/85		Gr 14	R F S	O
ME	Winthrop Landfill	Winthrop	10/81	9/83	502	V F S	O
	6 Final + 1 Proposed = 7 Total Sites						
MI	American Anodco, Inc.	Ionia	6/86		Gr 4	D	
MI	Anderson Development Co.	Adrian	12/82	9/83	690	R	
MI	Auto Ion Chemicals, Inc.	Kalamazoo	12/82	9/83	646	V F	O
MI	Avenue "E" Ground Water Contamin	Traverse City	10/84	6/86	682	S	
MI	Barrels, Inc.	Lansing	1/87		Gr 7	R	I
MI	Berlin & Farro	Swartz Creek	7/82	9/83	13	V R F S	O
MI	Burrows Sanitation	Hartford	9/83	9/84	704	V R	O
MI	Butterworth #2 Landfill	Grand Rapids	12/82	9/83	173	F	
MI	Cemetery Dump	Rose Center	12/82	9/83	571	R	
MI	Charlevoix Municipal Well	Charlevoix	12/82	9/83	437	R	I
MI	Chem Central	Wyoming Township	12/82	9/83	429	S	
MI	Clare Water Supply	Clare	12/82	9/84	422	R F	
MI	Cliff/Dow Dump	Marquette	12/82	9/83	559	F	
MI	Duell & Gardner Landfill	Dalton Township	12/82	9/83	551	D	
MI	E.I. Du Pont (Montague Plant)	Montague	10/84		Gr 9	D	O
MI	Electrovoice	Buchanan	12/82	9/84	526	D	
MI	Folkertsma Refuse	Grand Rapids	6/86		Gr 13	D	
MI	Ford Motor Co. (Sludge Lagoon)	Ypsilanti	1/87		Gr 14	D	
MI	Forest Waste Products	Otisville	12/82	9/83	417	R F	
MI	G&H Landfill	Utica	7/82	9/83	187	R	
MI	Grand Traverse Overall Supply Co.	Greilickville	12/82	9/83	518	F	
MI	Gratiot County Landfill *	St. Louis	10/81	9/83	78	V R F S	O

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			Proposed or Announced$_1$	Final			
MI	H. Brown Co., Inc.	Grand Rapids	4/85	6/86	396	D	
MI	Hedblum Industries	Oscoda	12/82	9/83	461	F	
MI	Hooker (Montague Plant)	Montague	9/85		Gr 12	V S	I
MI	Ionia City Landfill	Ionia	12/82	9/83	676	V F	I
MI	J & L Landfill	Rochester Hills	6/86		Gr 10	D	
MI	K&L Avenue Landfill	Oshtemo Township	12/82	9/83	434	F	
MI	Kent City Mobile Home Park	Kent City	9/85	7/87	609	D	
MI	Kentwood Landfill	Kentwood	12/82	9/83	525	V F	
MI	Kysor Industrial Corp.	Cadillac	9/85		Gr 12	D	
MI	Lacks Industries, Inc.	Grand Rapids	10/84		Gr 12	D	
MI	Liquid Disposal, Inc.	Utica	7/82	9/83	24	R	O
MI	Mason County Landfill	Pere Marquette Twp	12/82	9/83	570	R F	
MI	McGraw Edison Corp.	Albion	12/82	9/83	617	V S	
MI	Metal Working Shop	Lake Ann	1/87		Gr 15	D	
MI	Metamora Landfill	Metamora	9/83	9/84	519	R	I
MI	Michigan Disposal(Cork Street Lf)	Kalamazoo	10/84		Gr 9	D	
MI	Motor Wheel, Inc.	Lansing	10/84	6/86	191	D	O
MI	North Bronson Industrial Area	Bronson	10/84	6/86	583	D	
MI	Northernaire Plating	Cadillac	7/82	9/83	59	R	O
MI	Novaco Industries	Temperance	12/82	9/83	430	R	
MI	Organic Chemicals, Inc.	Grandville	12/82	9/83	626	S	
MI	Ossineke Ground Water Contamin	Ossineke	12/82	9/83	593	D	
MI	Ott/Story/Cordova	Dalton Township	7/82	9/83	131	V R F S	O
MI	Packaging Corp. of America	Filer City	12/82	9/83	153	V F	
MI	Petoskey Municipal Well Field	Petoskey	12/82	9/83	315	F	
MI	Rasmussen's Dump	Green Oak Township	12/82	9/83	665	R	O
MI	Rockwell International (Allegan)	Allegan	4/85	7/87	144	D	
MI	Rose Township Dump	Rose Township	7/82	9/83	166	R	
MI	Roto-Finish Co., Inc.	Kalamazoo	10/84	6/86	372	D	O
MI	SCA Independent Landfill	Muskegon Heights	12/82	9/83	548	S	
MI	Shiawassee River	Howell	12/82	9/83	692	D	
MI	South Macomb Disposal (Lf 9 & 9A)	Macomb Township	10/84	6/86	601	D	
MI	Southwest Ottawa County Landfill	Park Township	12/82	9/83	401	V S	
MI	Sparta Landfill	Sparta Township	12/82	9/83	651	S	
MI	Spartan Chemical Co.	Wyoming	12/82	9/83	363	V S	
MI	Spiegelberg Landfill	Green Oak Township	12/82	9/83	121	R	O
MI	Springfield Township Dump	Davisburg	12/82	9/83	149	R	
MI	Sturgis Municipal Wells	Sturgis	9/83	9/84	335	R	
MI	Tar Lake	Mancelona Township	12/82	9/83	198	F	
MI	Thermo-Chem, Inc.	Muskegon	10/84	6/86	132	D	
MI	Torch Lake	Houghton County	10/84	6/86	232	D	
MI	U.S. Aviex	Howard Township	12/82	9/83	602	V F	

National Priorities List,
Final and Proposed Sites (by State)
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St	Site Name	City/County	Date: Proposed or Announced₁	Date: Final	Rank/ Group₂	Response Category₃	Cleanup Status₄
MI	Velsicol Chemical (Michigan)	St. Louis	12/82	9/83	140	V S	I
MI	Verona Well Field	Battle Creek	7/82	9/83	227	R	I
MI	Wash King Laundry	Pleasant Plains Twp	12/82	9/83	389	R	
MI	Waste Management-Mich (Holland)	Holland	10/84	6/86	466	D	
MI	Whitehall Municipal Wells	Whitehall	12/82	9/84	520	R	
	58 Final + 11 Proposed = 69 Total Sites						
MN	Adrian Municipal Well Field	Adrian	10/84	6/86	610	R	
MN	Agate Lake Scrapyard	Fairview Township	10/84	6/86	734	R	O
MN	Arrowhead Refinery Co.	Hermantown	9/83	9/84	290	R	I
MN	Boise Cascade/Onan/Medtronics	Fridley	9/83	9/84	178	S	O
MN	Burlington Northern (Brainerd)	Brainerd/Baxter	7/82	9/83	231	V	O
MN	East Bethel Demolition Landfill	East Bethel Township	9/85	6/86	763	D	
MN	FMC Corp. (Fridley Plant)	Fridley	7/82	9/83	17	V	O
MN	Freeway Sanitary Landfill	Burnsville	9/85	6/86	253	D	
MN	General Mills/Henkel Corp.	Minneapolis	9/83	9/84	491	S	
MN	Joslyn Manufacturing & Supply Co.	Brooklyn Center	9/83	9/84	281	V S	
MN	Koch Refining Co./N-Ren Corp.	Pine Bend	10/84	6/86	686	V S	
MN	Koppers Coke	St. Paul	10/81	9/83	105	V S	
MN	Kummer Sanitary Landfill	Bemidji	10/84	6/86	510	R	I
MN	Kurt Manufacturing Co.	Fridley	10/84	6/86	674	S	
MN	LaGrand Sanitary Landfill	LaGrand Township	6/86	7/87	457	S	
MN	Lehillier/Mankato Site	Lehillier/Mankato	7/82	9/83	320	R	O
MN	Long Prairie Ground Water Contam	Long Prairie	10/84	6/86	657	R	
MN	MacGillis & Gibbs/Bell Lumber	New Brighton	9/83	9/84	202	R S	I
MN	New Brighton/Arden Hills	New Brighton	7/82	9/83	39	R	O
MN	NL Industries/Taracorp/Golden	St. Louis Park	10/81	9/83	392	S	I
MN	Nutting Truck & Caster Co.	Faribault	9/83	9/84	448	S	
MN	Oak Grove Sanitary Landfill	Oak Grove Township	10/84	6/86	295	R	
MN	Oakdale Dump	Oakdale	10/81	9/83	77	V	O
MN	Olmsted County Sanitary Landfill	Oronoco	10/84	6/86	373	D	
MN	Perham Arsenic Site	Perham	9/83	9/84	436	R	O
MN	Pine Bend Sanitary Landfill	Dakota County	10/84	6/86	145	S	
MN	Reilly Tar (St. Louis Park Plant) *	St. Louis Park	10/81	9/83	43	R F S	O
MN	Ritari Post & Pole	Sebeka	1/87	7/87	730	D	
MN	South Andover Site	Andover	10/81	9/83	522	R	O
MN	St. Augusta San Lndfil/Engen Dump	St. Augusta Township	9/85	7/87	587	D	
MN	St. Louis River Site	St. Louis County	9/83	9/84	645	R	I
MN	St. Regis Paper Co.	Cass Lake	9/83	9/84	135	S	I
MN	Twin Cities Air Force(SAR Lndfll)	Minneapolis	1/87	7/87	Gr 13F	R	
MN	U of Minnesota Rosemount Res Cent	Rosemount	10/84	6/86	252	S	

National Priorities List,
Final and Proposed Sites (by State)
July 1987

St	Site Name	City/County	Date: Proposed or Announced[1]	Date: Final	Rank/ Group[2]	Response Category[3]	Cleanup Status[4]
MN	Union Scrap	Minneapolis	9/83	9/84	316	S	
MN	Waite Park Wells	Waite Park	9/85	6/86	658	R	
MN	Washington County Landfill	Lake Elmo	9/83	9/84	336	S	
MN	Waste Disposal Engineering	Andover	7/82	9/83	167	V R F S	
MN	Whittaker Corp.	Minneapolis	9/83	9/84	390	S	
MN	Windom Dump	Windom	10/84	6/86	431	D	
	40 Final + 0 Proposed = 40 Total Sites						
MO	Bee Cee Manufacturing Co.	Malden	10/84	6/86	769	D	
MO	Conservation Chemical Co.	Kansas City	4/85		Gr 15	R F	
MO	Ellisville Site *	Ellisville	10/81	9/83	90	R F S	O
MO	Findett Corp.	St. Charles	10/84		Gr 9	F	
MO	Fulbright Landfill	Springfield	10/81	9/83	375	D	
MO	Kem-Pest Laboratories	Cape Girardeau	1/87		Gr 12	D	
MO	Lake City Army Plant (NW Lagoon)	Independence	10/84	7/87	Gr 13F	R	O
MO	Lee Chemical	Liberty	10/84	6/86	228	D	O
MO	Minker/Stout/Romaine Creek	Imperial	12/82	9/83	474	R	O
MO	North-U Drive Well Contamination	Springfield	10/84	6/86	755	R	O
MO	Quail Run Mobile Manor	Gray Summit	9/83		Gr 16	R	O
MO	Quality Plating	Sikeston	10/84	6/86	374	D	
MO	Shenandoah Stables	Moscow Mills	12/82	9/83	725	F	
MO	Solid State Circuits, Inc.	Republic	10/84	6/86	445	R F S	O
MO	Syntex Facility	Verona	12/82	9/83	288	V F	I
MO	Times Beach Site	Times Beach	3/83	9/83	388	R	O
MO	Valley Park TCE	Valley Park	4/85	6/86	513	D	
MO	Weldon Spring Quarry (USDOE/Army)	St.Charles County	10/84	7/87	Gr 2F	R	
MO	Wheeling Disposal Service Co. Lf	Amazonia	1/87		Gr 15	D	
	14 Final + 5 Proposed = 19 Total Sites						
MS	Flowood Site *	Flowood	9/83	9/84	98	V	
MS	Newsom Brothers/Old Reichhold	Columbia	10/84	6/86	258	R	O
	2 Final + 0 Proposed = 2 Total Sites						
MT	Anaconda Co. Smelter	Anaconda	12/82	9/83	47	V F	I
MT	Burlington Northern(Somers Plant)	Somers	10/84		Gr 10	V F	O
MT	East Helena Site	East Helena	9/83	9/84	29	V F	
MT	Idaho Pole Co.	Bozeman	10/84	6/86	425	D	
MT	Libby Ground Water Contamination	Libby	12/82	9/83	452	F	
MT	Milltown Reservoir Sediments	Milltown	12/82	9/83	289	R	I

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St	Site Name	City/County	Date Proposed or Announced$_1$	Date Final	Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
MT	Montana Pole and Treating	Butte	6/86	7/87	624	R	I
MT	Mouat Industries	Columbus	10/84	6/86	669	D	
MT	Silver Bow Creek/Butte Area	Sil Bow/Deer Lodge	12/82	9/83	20	R	
	8 Final + 1 Proposed = 9 Total Sites						
NC	Aberdeen Pesticide Dumps	Aberdeen	1/87		Gr 3	V R	O
NC	Bypass 601 Ground Water Contamin	Concord	10/84	6/86	444	R	I
NC	Cape Fear Wood Preserving	Fayetteville	6/86	7/87	573	R	O
NC	Carolina Transformer Co.	Fayetteville	1/87	7/87	596	R F	O
NC	Celanese(Shelby Fiber Operations)	Shelby	10/84	6/86	188	V	I
NC	Charles Macon Lagoon & Drum Stor	Cordova	1/87	7/87	224	R F	O
NC	Chemtronics, Inc.	Swannanoa	12/82	9/83	722	V R F	
NC	Jadco-Hughes Facility	Belmont	10/84	6/86	350	D	
NC	Martin Marietta, Sodyeco, Inc.	Charlotte	12/82	9/83	151	V	
NC	National Starch & Chemical Corp.	Salisbury	4/85		Gr 14	D	
NC	NC State U (Lot 86, Farm Unit #1)	Raleigh	10/84	6/86	200	D	
	9 Final + 2 Proposed = 11 Total Sites						
ND	Arsenic Trioxide Site *	Southeastern ND	10/81	9/83	91	R	I
	1 Final + 0 Proposed = 1 Total Sites						
NE	Cornhusker Army Ammunition Plant	Hall County	10/84	7/87	Gr 4F	R	O
NE	Hastings Ground Water Contamin	Hastings	10/84	6/86	339	R	
NE	Lindsay Manufacturing Co.	Lindsay	10/84		Gr 5	V S	O
NE	Monroe Auto Equipment Co.	Cozad	9/85		Gr 2	D	
NE	Waverly Ground Water Contamin	Waverly	10/84	6/86	446	R	
	3 Final + 2 Proposed = 5 Total Sites						
NH	Auburn Road Landfill	Londonderry	12/82	9/83	489	F S	
NH	Coakley Landfill	North Hampton	10/84	6/86	747	V R S	
NH	Dover Municipal Landfill	Dover	12/82	9/83	469	R	
NH	Kearsarge Metallurgical Corp.	Conway	9/83	9/84	419	S	
NH	Keefe Environmental Services	Epping	10/81	9/83	19	R S	O
NH	Mottolo Pig Farm	Raymond	4/85	7/87	370	R F S	O
NH	Ottati & Goss/Kingston Steel Drum	Kingston	10/81	9/83	130	V R F S	O
NH	Savage Municipal Water Supply	Milford	9/83	9/84	456	F	
NH	Somersworth Sanitary Landfill	Somersworth	12/82	9/83	16	R	
NH	South Municipal Water Supply Well	Peterborough	9/83	9/84	501	F S	

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St	Site Name	City/County	Date		Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
			Proposed or Announced$_1$	Final			
NH	Sylvester *	Nashua	10/81	9/83	23	R S	0
NH	Tibbets Road	Barrington	4/85	6/86	360	R	0
NH	Tinkham Garage	Londonderry	12/82	9/83	298	F S	0
	13 Final + 0 Proposed = 13 Total Sites						
NJ	A. O. Polymer	Sparta Township	12/82	9/83	750	R	
NJ	American Cyanamid Co.	Bound Brook	12/82	9/83	174	V S	
NJ	Asbestos Dump	Millington	12/82	9/83	404	V F	
NJ	Beachwood/Berkley Wells	Berkley Township	12/82	9/83	332	R	
NJ	Bog Creek Farm	Howell Township	12/82	9/83	300	R	
NJ	Brick Township Landfill	Brick Township	12/82	9/83	58	V S	
NJ	Bridgeport Rental & Oil Services	Bridgeport	10/81	9/83	35	R	0
NJ	Burnt Fly Bog	Marlboro Township	10/81	9/83	42	R S	0
NJ	Caldwell Trucking Co.	Fairfield	12/82	9/83	51	R S	
NJ	Chemical Control	Elizabeth	10/81	9/83	223	R S	0
NJ	Chemical Leaman Tank Lines, Inc.	Bridgeport	9/83	9/84	212	V F	
NJ	Chemsol, Inc.	Piscataway	12/82	9/83	313	V S	
NJ	Ciba-Geigy Corp.	Toms River	12/82	9/83	172	V F	
NJ	Cinnaminson Ground Water Contamin	Cinnaminson Township	10/84	6/86	440	R	
NJ	Combe Fill North Landfill	Mount Olive Twp	12/82	9/83	205	R	
NJ	Combe Fill South Landfill	Chester Township	12/82	9/83	264	R	
NJ	Cooper Road	Voorhees Township	9/83	9/84	473	V S	0
NJ	Cosden Chemical Coatings Corp.	Beverly	1/87	7/87	586	D	
NJ	CPS/Madison Industries	Old Bridge Township	12/82	9/83	10	D	
NJ	Curcio Scrap Metal, Inc.	Saddle Brook Twp	1/87	7/87	563	D	
NJ	D'Imperio Property	Hamilton Township	10/81	9/83	76	R	I
NJ	Dayco Corp./L.E Carpenter Co.	Wharton Borough	4/85	7/87	246	V S	0
NJ	De Rewal Chemical Co.	Kingwood Township	9/83	9/84	497	F	
NJ	Delilah Road	Egg Harbor Township	9/83	9/84	182	R	
NJ	Denzer & Schafer X-Ray Co.	Bayville	12/82	9/83	379	V S	
NJ	Diamond Alkali Co.	Newark	9/83	9/84	523	V R F S	0
NJ	Dover Municipal Well 4	Dover Township	12/82	9/83	752	R	
NJ	Ellis Property	Evesham Township	12/82	9/83	553	R	0
NJ	Evor Phillips Leasing	Old Bridge Township	12/82	9/83	479	R	
NJ	Ewan Property	Shamong Township	9/83	9/84	176	R	
NJ	Fair Lawn Well Field	Fair Lawn	12/82	9/83	318	V S	
NJ	Florence Land Recontouring Lndfil	Florence Township	9/83	9/84	215	R	
NJ	Fort Dix (Landfill Site)	Pemberton Township	10/84	7/87	Gr 10F	R	
NJ	Fried Industries	East Brunswick Twp	10/84	6/86	614	R	0
NJ	GEMS Landfill	Gloucester Township	7/82	9/83	12	R S	I
NJ	Glen Ridge Radium Site	Glen Ridge	10/84	2/85	184	R	0

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St	Site Name	City/County	Date Proposed or Announced[1]	 Final	Rank/ Group[2]	Response Category[3]	Cleanup Status[4]
NJ	Goose Farm	Plumstead Township	10/81	9/83	207	V R F S	O
NJ	Helen Kramer Landfill	Mantua Township	7/82	9/83	4	R S	
NJ	Hercules, Inc. (Gibbstown Plant)	Gibbstown	12/82	9/83	380	D	
NJ	Hopkins Farm	Plumstead Township	9/83	9/84	572	S	
NJ	Horstmann's Dump	East Hanover	1/87		Gr 15	D	
NJ	Imperial Oil/Champion Chemicals	Morganville	12/82	9/83	585	R	
NJ	Jackson Township Landfill	Jackson Township	12/82	9/83	432	D	O
NJ	JIS Landfill	Jamesburg/S. Brnswck	12/82	9/83	265	S	
NJ	Kin-Buc Landfill	Edison Township	10/81	9/83	169	V R F	O
NJ	King of Prussia	Winslow Township	12/82	9/83	218	V F	O
NJ	Krysowaty Farm	Hillsborough	7/82	9/83	106	R	O
NJ	Landfill & Development Co.	Mount Holly	9/83	9/84	604	S	
NJ	Lang Property	Pemberton Township	12/82	9/83	192	F	
NJ	Lipari Landfill	Pitman	10/81	9/83	1	R F	O
NJ	Lodi Municipal Well	Lodi	10/84		Gr 13	R	
NJ	Lone Pine Landfill	Freehold Township	10/81	9/83	15	V R F	
NJ	M&T Delisa Landfill	Asbury Park	12/82	9/83	638	V F	
NJ	Mannheim Avenue Dump	Galloway Township	12/82	9/83	484	V F	I
NJ	Matlack, Inc.	Woolwich Township	9/85		Gr 12	S	
NJ	Maywood Chemical Co.	Maywood/Rochelle Pk	12/82	9/83	162	R	O
NJ	Metaltec/Aerosystems	Franklin Borough	12/82	9/83	189	R	
NJ	Monitor Devices/Intercircuits Inc	Wall Township	4/85	6/86	351	R	
NJ	Monroe Township Landfill	Monroe Township	12/82	9/83	326	V S	O
NJ	Montclair/West Orange Radium Site	Montclair/W Orange	10/84	2/85	185	R	O
NJ	Montgomery Township Housing Devel	Montgomery Township	12/82	9/83	438	R	
NJ	Myers Property	Franklin Township	12/82	9/83	588	R	O
NJ	Nascolite Corp.	Millville	9/83	9/84	163	R	
NJ	Naval Air Engineering Center	Lakehurst	9/85	7/87	Gr 4F	R	
NJ	Naval Weapons Stat Earle (Site A)	Colts Neck	10/84		Gr 10F	R	
NJ	NL Industries	Pedricktown	12/82	9/83	134	V F	
NJ	Pepe Field	Boonton	12/82	9/83	589	R	
NJ	Pijak Farm	Plumstead Township	10/81	9/83	293	V R S	I
NJ	PJP Landfill	Jersey City	12/82	9/83	765	R S	O
NJ	Pomona Oaks Residential Wells	Galloway Township	10/84	6/86	653	R	O
NJ	Price Landfill *	Pleasantville	10/81	9/83	6	R F	O
NJ	Radiation Technology, Inc.	Rockaway Township	9/83	9/84	317	V S	
NJ	Reich Farms	Pleasant Plains	12/82	9/83	123	R	
NJ	Renora, Inc.	Edison Township	12/82	9/83	378	V F	O
NJ	Ringwood Mines/Landfill	Ringwood Borough	12/82	9/83	136	V F	
NJ	Rockaway Borough Well Field	Rockaway Township	12/82	9/83	327	R	
NJ	Rockaway Township Wells	Rockaway	12/82	9/83	753	D	O
NJ	Rocky Hill Municipal Well	Rocky Hill Borough	12/82	9/83	439	R	

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St	Site Name	City/County	Date Proposed or Announced$_1$	Date Final	Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
NJ	Roebling Steel Co.	Florence	12/82	9/83	364	R	
NJ	Sayreville Landfill	Sayreville	12/82	9/83	468	D	
NJ	Scientific Chemical Processing	Carlstadt	12/82	9/83	74	V F S	O
NJ	Sharkey Landfill	Parsippany/Troy Hls	12/82	9/83	194	R	
NJ	Shieldalloy Corp.	Newfield Borough	9/83	9/84	46	V S	
NJ	South Brunswick Landfill	South Brunswick	12/82	9/83	125	V F	O
NJ	Spence Farm	Plumstead Township	10/81	9/83	256	V R S	I
NJ	Swope Oil & Chemical Co.	Pennsauken	7/82	9/83	499	V R F	O
NJ	Syncon Resins	South Kearny	7/82	9/83	294	R	O
NJ	Tabernacle Drum Dump	Tabernacle Township	9/83	9/84	472	V R F	O
NJ	U.S. Radium Corp.	Orange	12/82	9/83	449	R F	
NJ	Universal Oil Products(Chem Div)	East Rutherford	12/82	9/83	109	V S	
NJ	Upper Deerfield Township San Lndf	Upper Deerfield Twp	9/83	9/84	605	R F	
NJ	Ventron/Velsicol	Wood Ridge Borough	9/83	9/84	158	V R S	
NJ	Vineland Chemical Co., Inc.	Vineland	9/83	9/84	41	V R	
NJ	Vineland State School	Vineland	12/82	9/83	367	V S	I
NJ	W. R. Grace & Co. (Wayne Plant)	Wayne Township	9/83	9/84	222	R	O
NJ	Waldick Aerospace Devices, Inc.	Wall Township	10/84	6/86	271	R S	O
NJ	Williams Property	Swainton	12/82	9/83	377	R	
NJ	Wilson Farm	Plumstead Township	9/83	9/84	579	D	
NJ	Woodland Route 532 Dump	Woodland Township	9/83	9/84	539	V R S	
NJ	Woodland Route 72 Dump	Woodland Township	9/83	9/84	684	V R S	

96 Final + 4 Proposed = 100 Total Sites

St	Site Name	City/County	Proposed or Announced$_1$	Final	Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
NM	AT & SF (Clovis)	Clovis	10/81	9/83	611	V F	
NM	Homestake Mining Co.	Milan	10/81	9/83	567	V F	O
NM	South Valley *	Albuquerque	7/82	9/83	87	R F	I
NM	United Nuclear Corp.	Church Rock	10/81	9/83	711	F	

4 Final + 0 Proposed = 4 Total Sites

St	Site Name	City/County	Proposed or Announced$_1$	Final	Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
NY	American Thermostat Co.	South Cairo	12/82	9/83	615	V R S	
NY	Anchor Chemicals	Hicksville	10/84	6/86	465	D	
NY	Applied Environmental Services	Glenwood Landing	10/84	6/86	358	S	O
NY	Batavia Landfill	Batavia	10/81	9/83	177	V F	
NY	BEC Trucking	Town of Vestal	10/84	6/86	701	D	
NY	BioClinical Laboratories, Inc.	Bohemia	6/86		Gr 10	D	
NY	Brewster Well Field	Putnam County	12/82	9/83	441	R	
NY	Byron Barrel & Drum	Byron	10/84	6/86	463	R F	O
NY	Claremont Polychemical	Old Bethpage	10/84	6/86	670	V S	
NY	Clothier Disposal	Town of Granby	10/84	6/86	560	R	

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St	Site Name	City/County	Date Proposed or Announced[1]	Date Final	Rank/ Group[2]	Response Category[3]	Cleanup Status[4]
NY	Colesville Municipal Landfill	Town of Colesville	10/84	6/86	718	V S	O
NY	Conklin Dumps	Conklin	6/86		Gr 12	D	
NY	Cortese Landfill	Vil of Narrowsburg	10/84	6/86	644	V S	
NY	Endicott Village Well Field	Village of Endicott	10/84	6/86	507	R	
NY	Facet Enterprises, Inc.	Elmira	10/81	9/83	235	V F	
NY	FMC Corp. (Dublin Road Landfill)	Town of Shelby	10/84	6/86	628	V S	
NY	Fulton Terminals	Fulton	12/82	9/83	486	V R	O
NY	GE Moreau	South Glen Falls	12/82	9/83	52	V F S	O
NY	General Motors (Cent Foundry Div)	Massena	9/83	9/84	369	V F	O
NY	Genzale Plating Co.	Franklin Square	6/86	7/87	591	D	
NY	Goldisc Recordings, Inc.	Holbrook	10/84	6/86	618	V	
NY	Griffiss Air Force Base	Rome	10/84	7/87	Gr 12F	R	
NY	Haviland Complex	Town of Hyde Park	10/84	6/86	607	R	
NY	Hertel Landfill	Plattekill	10/84	6/86	606	D	
NY	Hooker (102nd Street)	Niagara Falls	12/82	9/83	709	V F S	
NY	Hooker (Hyde Park)	Niagara Falls	12/82	9/83	547	V F S	
NY	Hooker (S Area)	Niagara Falls	12/82	9/83	155	V F S	
NY	Hooker Chemical/Ruco Polymer Corp	Hicksville	10/84	6/86	355	D	
NY	Hudson River PCBs	Hudson River	9/83	9/84	108	R	I
NY	Islip Municipal Sanitary Landfill	Islip	1/87		Gr 13	D	
NY	Johnstown City Landfill	Town of Johnstown	10/84	6/86	199	R	
NY	Jones Sanitation	Hyde Park	1/87	7/87	139	D	
NY	Katonah Municipal Well	Town of Bedford	10/84	6/86	527	R	O
NY	Kenmark Textile Corp.	Farmingdale	10/84	6/86	666	V	I
NY	Kentucky Avenue Well Field	Horseheads	7/82	9/83	402	R	
NY	Liberty Industrial Finishing	Farmingdale	10/84	6/86	168	V S	
NY	Love Canal	Niagara Falls	10/81	9/83	142	R F S	O
NY	Ludlow Sand & Gravel	Clayville	12/82	9/83	470	V S	
NY	Malta Rocket Fuel Area	Malta	6/86	7/87	608	D	
NY	Marathon Battery Corp.	Cold Springs	10/81	9/83	717	R	
NY	Mercury Refining, Inc.	Colonie	12/82	9/83	277	V S	
NY	Nepera Chemical Co., Inc.	Maybrook	10/84	6/86	397	V	
NY	Niagara County Refuse	Wheatfield	10/81	9/83	398	R	
NY	North Sea Municipal Landfill	North Sea	10/84	6/86	597	V R F	O
NY	Old Bethpage Landfill	Oyster Bay	10/81	9/83	44	V S	
NY	Olean Well Field	Olean	10/81	9/83	279	V R F	O
NY	Pasley Solvents & Chemicals, Inc.	Hempstead	10/84	6/86	403	D	
NY	Pollution Abatement Services *	Oswego	10/81	9/83	7	R	O
NY	Port Washington Landfill	Port Washington	12/82	9/83	262	R F	
NY	Preferred Plating Corp.	Farmingdale	10/84	6/86	536	D	
NY	Ramapo Landfill	Ramapo	12/82	9/83	274	V R S	
NY	Richardson Hill Road Lndfll/Pond	Sidney Center	6/86	7/87	542	D	

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St	Site Name	City/County	Date Proposed or Announced$_1$	Date Final	Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
NY	Robintech, Inc./National Pipe Co.	Town of Vestal	10/84	6/86	700	R F	
NY	Rowe Industries Ground Water Cont	Noyack/Sag Harbor	6/86	7/87	654	R	O
NY	Sarney Farm	Amenia	10/84	6/86	621	R F	
NY	Sinclair Refinery	Wellsville	7/82	9/83	119	R	
NY	SMS Instruments, Inc.	Deer Park	10/84	6/86	460	D	
NY	Solvent Savers	Lincklaen	12/82	9/83	544	D	
NY	Suffern Village Well Field	Village of Suffern	10/84	6/86	506	R	
NY	Syosset Landfill	Oyster Bay	12/82	9/83	115	V F	
NY	Tronic Plating Co., Inc.	Farmingdale	10/84	6/86	266	V F	
NY	Vestal Water Supply Well 1-1	Vestal	12/82	9/83	442	R	I
NY	Vestal Water Supply Well 4-2	Vestal	12/82	9/83	333	V S	
NY	Volney Municipal Landfill	Town of Volney	10/84	6/86	627	V R S	O
NY	Warwick Landfill	Warwick	9/85		Gr 15	D	
NY	Wide Beach Development	Brant	12/82	9/83	72	R	O
NY	York Oil Co.	Moira	7/82	9/83	209	R F	O
	63 Final + 4 Proposed = 67 Total Sites						
OH	Allied Chemical & Ironton Coke	Ironton	12/82	9/83	226	R F	I
OH	Alsco Anaconda	Gnadenhutten	10/84	6/86	304	S	
OH	Arcanum Iron & Metal	Darke County	12/82	9/83	28	R F	
OH	Big D Campground	Kingsville	12/82	9/83	698	F	
OH	Bowers Landfill	Circleville	12/82	9/83	171	V F	
OH	Buckeye Reclamation	St. Clairsville	12/82	9/83	535	V F	I
OH	Chem-Dyne *	Hamilton	10/81	9/83	82	V R F S	O
OH	Coshocton Landfill	Franklin Township	12/82	9/83	409	F	O
OH	E.H. Schilling Landfill	Hamilton Township	12/82	9/83	558	R	I
OH	Fields Brook	Ashtabula	10/81	9/83	268	R	I
OH	Fultz Landfill	Jackson Township	12/82	9/83	407	R	I
OH	General Electric(Coshocton Plant)	Coshocton	10/84		Gr 2	D	
OH	Industrial Excess Landfill	Uniontown	10/84	6/86	164	R S	I
OH	Laskin/Poplar Oil Co.	Jefferson Township	7/82	9/83	492	V R F	O
OH	Miami County Incinerator	Troy	9/83	9/84	66	F	
OH	Nease Chemical	Salem	12/82	9/83	220	V S	I
OH	New Lyme Landfill	New Lyme	12/82	9/83	683	R	
OH	Old Mill	Rock Creek	12/82	9/83	493	R	O
OH	Ormet Corp.	Hannibal	9/85	7/87	242	V F S	
OH	Powell Road Landfill	Dayton	9/83	9/84	671	R	I
OH	Pristine, Inc.	Reading	12/82	9/83	531	R F	I
OH	Republic Steel Corp. Quarry	Elyria	10/84	6/86	729	D	
OH	Sanitary Landfill Co. (IWD)	Dayton	10/84	6/86	511	D	
OH	Skinner Landfill	West Chester	12/82	9/83	720	R	I

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St	Site Name	City/County	Date: Proposed or Announced$_1$	Date: Final	Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
OH	South Point Plant	South Point	9/83	9/84	243	F	I
OH	Summit National	Deerfield Township	10/81	9/83	141	R	O
OH	TRW, Inc. (Minerva Plant)	Minerva	6/86		Gr 9	V S	I
OH	United Scrap Lead Co., Inc.	Troy	9/83	9/84	54	R	O
OH	Van Dale Junkyard	Marietta	10/84	6/86	623	D	
OH	Zanesville Well Field	Zanesville	12/82	9/83	505	V S	
	28 Final + 2 Proposed = 30 Total Sites						
OK	Compass Industries (Avery Drive)	Tulsa	9/83	9/84	483	R	
OK	Hardage/Criner	Criner	10/81	9/83	165	F	
OK	Sand Springs Petrochemical Cmplx	Sand Springs	10/84	6/86	761	R F	O
OK	Tar Creek (Ottawa County)	Ottawa County	10/81	9/83	55	R	C
OK	Tenth Street Dump/Junkyard	Oklahoma City	1/87	7/87	693	R F	O
OK	Tinker AFB (Soldier Cr/Bldg 3001)	Oklahoma City	4/85	7/87	Gr 7F	R	
	6 Final + 0 Proposed = 6 Total Sites						
OR	Allied Plating, Inc.	Portland	1/87		Gr 9	D	
OR	Gould, Inc.	Portland	12/82	9/83	643	V	
OR	Martin-Marietta Aluminum Co.	The Dalles	10/84	6/86	291	V	
OR	Teledyne Wah Chang	Albany	12/82	9/83	117	V	
OR	Umatilla Army Depot (Lagoons)	Hermiston	10/84	7/87	Gr 14F	R	
OR	United Chrome Products, Inc.	Corvallis	9/83	9/84	689	R	
	5 Final + 1 Proposed = 6 Total Sites						
PA	Aladdin Plating	Scott Township	1/87	7/87	508	R	I
PA	Ambler Asbestos Piles	Ambler	10/84	6/86	561	V R F S	O
PA	American Electronics Laboratories	Montgomeryville	1/87		Gr 11	D	
PA	Ametek, Inc. (Hunter Spring Div)	Hatfield	1/87		Gr 11	D	
PA	Avco Lycoming (Williamsport Div)	Williamsport	1/87		Gr 7	V S	I
PA	Bally Ground Water Contamination	Bally Borough	6/86	7/87	443	V F	
PA	Bendix Flight Systems Division	Bridgewater Township	9/85	7/87	598	D	O
PA	Berks Sand Pit	Longswamp Township	9/83	9/84	650	R	O
PA	Blosenski Landfill	West Caln Township	12/82	9/83	705	R F	
PA	Brodhead Creek	Stroudsburg	12/82	9/83	687	R F	O
PA	Brown's Battery Breaking	Shoemakersville	10/84	6/86	459	R F	O
PA	Bruin Lagoon	Bruin Borough	10/81	9/83	3	R F	O
PA	Butler Mine Tunnel	Pittston	6/86	7/87	180	V R F	O
PA	C & D Recycling	Foster Township	9/85	7/87	287	R	O
PA	Centre County Kepone	State College Boro	12/82	9/83	267	S	O

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St	Site Name	City/County	Date		Rank/ Group[2]	Response Category[3]	Cleanup Status[4]
			Proposed or Announced[1]	Final			
PA	Commodore Semiconductor Group	Lower Providence Twp	1/87		Gr 7	D	I
PA	Craig Farm Drum	Parker	12/82	9/83	766	V S	O
PA	Croydon TCE	Croydon	9/85	6/86	672	R	
PA	CryoChem, Inc.	Worman	6/86		Gr 16	R	
PA	Delta Quarries/Stotler Landfill	Antis/Logan Twps	6/86		Gr 8	D	
PA	Dorney Road Landfill	Upper Macungie Twp	9/83	9/84	248	R	O
PA	Douglassville Disposal	Douglassville	12/82	9/83	103	R	
PA	Drake Chemical	Lock Haven	7/82	9/83	418	R F	O
PA	East Mount Zion	Springettsbury Twp	9/83	9/84	365	R	
PA	Eastern Diversified Metals	Hometown	6/86		Gr 14	V S	
PA	Fischer & Porter Co.	Warminster	12/82	9/83	748	V F	O
PA	Gentle Cleaners/Granite Knitting	Souderton	1/87		Gr 11	D	
PA	Havertown PCP	Haverford	12/82	9/83	423	V R F	O
PA	Hebelka Auto Salvage Yard	Weisenberg Township	6/86	7/87	655	R	
PA	Heleva Landfill	North Whitehall Twp	12/82	9/83	175	V R F	O
PA	Hellertown Manufacturing Co.	Hellertown	1/87		Gr 3	D	
PA	Henderson Road	Upper Merion Twp	9/83	9/84	354	V F	
PA	Hranica Landfill	Buffalo Township	10/81	9/83	150	V F S	O
PA	Hunterstown Road	Straban Township	10/84	6/86	203	V R F	O
PA	Industrial Lane	Williams Township	9/83	9/84	322	R F	
PA	J.W. Rex/Allied Paint/Keystone	Lansdale	1/87		Gr 11	D	
PA	Keystone Sanitation Landfill	Union Township	4/85	7/87	595	D	O
PA	Kimberton Site	Kimberton Borough	12/82	9/83	740	D	O
PA	Lackawanna Refuse	Old Forge Borough	12/82	9/83	482	R	O
PA	Lansdowne Radiation Site	Lansdowne	4/85	9/85	770	R	O
PA	Letterkenny Army Depot (PDO Area)	Franklin County	4/85		Gr 10F	R	
PA	Letterkenny Army Depot (SE Area)	Chambersburg	10/84	7/87	Gr 12F	R	O
PA	Lindane Dump	Harrison Township	10/81	9/83	156	D	O
PA	Lord-Shope Landfill	Girard Township	10/81	9/83	412	V S	O
PA	Malvern TCE	Malvern	12/82	9/83	234	D	O
PA	McAdoo Associates *	McAdoo Borough	10/81	9/83	26	R	O
PA	Metal Banks	Philadelphia	12/82	9/83	620	V F	O
PA	Middletown Air Field	Middletown	10/84	6/86	498	D	O
PA	Mill Creek Dump	Erie	9/83	9/84	183	R	O
PA	Modern Sanitation Landfill	Lower Windsor Twp	10/84	6/86	581	V S	
PA	Moyers Landfill	Eagleville	12/82	9/83	454	R	
PA	MW Manufacturing	Valley Township	10/84	6/86	237	R S	O
PA	Naval Air Develop Center(8 Areas)	Warminster Township	6/86		Gr 2F	R	I
PA	Novak Sanitary Landfill	South Whitehall Twp	1/87		Gr 7	D	
PA	Old City of York Landfill	Seven Valleys	12/82	9/83	580	V S	
PA	Osborne Landfill	Grove City	7/82	9/83	112	V S	
PA	Palmerton Zinc Pile	Palmerton	12/82	9/83	306	V F	

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St	Site Name	City/County	Date Proposed or Announced$_1$	Date Final	Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
PA	Paoli Rail Yards	Paoli	1/87		Gr 14	V R F	I
PA	Presque Isle	Erie	12/82	9/83	376	R	
PA	Reeser's Landfill	Upper Macungie Twp	4/85	7/87	712	R	
PA	Resin Disposal	Jefferson Borough	12/82	9/83	451	D	O
PA	Revere Chemical Co.	Nockamixon Township	9/85	7/87	675	R	O
PA	River Road Lf/Waste Mngmnt, Inc.	Hermitage	1/87		Gr 7	D	
PA	Rohm and Haas Co. Landfill	Bristol Township	4/85		Gr 4	D	
PA	Route 940 Drum Dump	Pocono Summit	9/85	7/87	285	D	I
PA	Salford Quarry	Salford Township	1/87		Gr 2	D	
PA	Shriver's Corner	Straban Township	10/84	6/86	247	V R F	O
PA	Spra-Fin, Inc.	North Wales	1/87		Gr 11	D	
PA	Stanley Kessler	King of Prussia	12/82	9/83	584	F	O
PA	Taylor Borough Dump	Taylor Borough	9/83	9/84	694	R F	O
PA	Transicoil, Inc.	Worcester	1/87		Gr 16	D	
PA	Tysons Dump	Upper Merion Twp	9/83	9/84	25	V R F	O
PA	Voortman Farm	Upper Saucon Twp	12/82	9/83	767	R	O
PA	Wade (ABM)	Chester	10/81	9/83	481	R F S	O
PA	Walsh Landfill	Honeybrook Township	9/83	9/84	603	R F	O
PA	Westinghouse Elevator Co. Plant	Gettysburg	10/84	6/86	488	V R F	O
PA	Westline Site	Westline	12/82	9/83	667	R	O
PA	Whitmoyer Laboratories	Jackson Township	10/84	6/86	244	R	
PA	William Dick Lagoons	West Caln Township	1/87	7/87	480	D	
PA	York County Solid Waste/Refuse Lf	Hopewell Township	4/85	7/87	282	V S	O
	61 Final + 19 Proposed = 80 Total Sites						
PR	Barceloneta Landfill	Florida Afuera	12/82	9/83	359	F	
PR	Fibers Public Supply Wells	Jobos	9/83	9/84	529	V F	
PR	Frontera Creek	Rio Abajo	12/82	9/83	302	F	
PR	GE Wiring Devices	Juana Diaz	12/82	9/83	681	V F	
PR	Juncos Landfill	Juncos	12/82	9/83	632	V F	O
PR	RCA Del Caribe	Barceloneta	12/82	9/83	685	D	
PR	Upjohn Facility	Barceloneta	9/83	9/84	352	V F	O
PR	Vega Alta Public Supply Wells	Vega Alta	9/83	9/84	334	F	
	8 Final + 0 Proposed = 8 Total Sites						
RI	Central Landfill	Johnston	10/84	6/86	233	V F S	
RI	Davis (GSR) Landfill	Glocester	4/85	6/86	411	S	
RI	Davis Liquid Waste	Smithfield	10/81	9/83	216	R S	O
RI	L&RR, Inc.	North Smithfield	12/82	9/83	179	S	
RI	Peterson/Puritan, Inc.	Lincoln/Cumberland	12/82	9/83	387	D	

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St	Site Name	City/County	Date: Proposed or Announced$_1$	Date: Final	Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
RI	Picillo Farm *	Coventry	10/81	9/83	79	R F S	0
RI	Stamina Mills, Inc.	North Smithfield	12/82	9/83	574	D	
RI	Western Sand & Gravel	Burrillville	10/81	9/83	160	R S	0
	8 Final + 0 Proposed = 8 Total Sites						
SC	Carolawn, Inc.	Fort Lawn	12/82	9/83	648	V R F	0
SC	Geiger (C & M Oil)	Rantoules	9/83	9/84	640	R	
SC	Golden Strip Septic Tank Service	Simpsonville	1/87	7/87	382	D	
SC	Independent Nail Co.	Beaufort	9/83	9/84	62	R	
SC	Kalama Specialty Chemicals	Beaufort	9/83	9/84	63	F S	
SC	Koppers Co., Inc (Florence Plant)	Florence	9/83	9/84	161	S	
SC	Leonard Chemical Co., Inc.	Rock Hill	9/83	9/84	225	F S	0
SC	Medley Farm Drum Dump	Gaffney	6/86		Gr 14	R	0
SC	Palmetto Recycling, Inc.	Columbia	1/87	7/87	738	S	0
SC	Palmetto Wood Preserving	Dixiana	9/83	9/84	420	R	0
SC	Rochester Property	Travelers Rest	6/85		Gr 8	D	
SC	Sangamo/Twelve-Mile/Hartwell PCB	Pickens	1/87		Gr 10	V F	
SC	SCRDI Bluff Road *	Columbia	10/81	9/83	83	V R F	0
SC	SCRDI Dixiana	Cayce	7/82	9/83	371	R F S	0
SC	Wamchem, Inc.	Burton	9/83	9/84	211	V	
	12 Final + 3 Proposed = 15 Total Sites						
SD	Whitewood Creek *	Whitewood	10/81	9/83	21	V	
	1 Final + 0 Proposed = 1 Total Sites						
TN	American Creosote (Jackson Plant)	Jackson	10/84	6/86	533	R	0
TN	Amnicola Dump	Chattanooga	12/82	9/83	366	R	
TN	Arlington Blending & Packaging	Arlington	1/87	7/87	410	R F	0
TN	Gallaway Pits	Gallaway	12/82	9/83	697	R F	0
TN	Lewisburg Dump	Lewisburg	12/82	9/83	616	V	
TN	Mallory Capacitor Co.	Waynesboro	1/87		Gr 15	D	
TN	Milan Army Ammunition Plant	Milan	10/84	7/87	Gr 2F	R	I
TN	Murray-Ohio Dump	Lawrenceburg	12/82	9/83	239	V S	
TN	North Hollywood Dump *	Memphis	10/81	9/83	95	V R S	0
TN	Velsicol Chem (Hardeman County)	Toone	12/82	9/83	208	S	0
	9 Final + 1 Proposed = 10 Total Sites						
TX	Air Force Plant #4 (Gen Dynamics)	Fort Worth	10/84		Gr 8F	R	0

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St	Site Name	City/County	Date		Rank/ Group[2]	Response Category[3]	Cleanup Status[4]
			Proposed or Announced[1]	Final			
TX	Bailey Waste Disposal	Bridge City	10/84	6/86	129	R	
TX	Bio-Ecology Systems, Inc.	Grand Prairie	10/81	9/83	537	R	O
TX	Brio Refining Co., Inc.	Friendswood	10/84		Gr 4	V F	
TX	Crystal Chemical Co.	Houston	7/82	9/83	34	R F	O
TX	Crystal City Airport	Crystal City	10/84	6/86	639	R	O
TX	French, Ltd.	Crosby	10/81	9/83	22	V R F	O
TX	Geneva Industries/Fuhrmann Energy	Houston	9/83	9/84	37	R F	O
TX	Harris (Farley Street)	Houston	7/82	9/83	578	V F	C
TX	Highlands Acid Pit	Highlands	7/82	9/83	450	R	I
TX	Koppers Co., Inc. (Texarkana Plt)	Texarkana	10/84	6/86	677	V F	
TX	Lone Star Army Ammunition Plant	Texarkana	10/84	7/87	Gr 14F	R	
TX	Motco, Inc. *	La Marque	10/81	9/83	27	V R F	O
TX	North Cavalcade Street	Houston	10/84	6/86	467	R	
TX	Odessa Chromium #1	Odessa	10/84	6/86	337	R	
TX	Odessa Chromium #2 (Andrews Hgwy)	Odessa	10/84	6/86	338	R	
TX	Pesses Chemical Co.	Fort Worth	10/84	6/86	762	R F	O
TX	Petro-Chemical (Turtle Bayou)	Liberty County	10/84	6/86	728	R	I
TX	Sheridan Disposal Services	Hempstead	6/86		Gr 15	V F	
TX	Sikes Disposal Pits	Crosby	10/81	9/83	30	R	O
TX	Sol Lynn/Industrial Transformers	Houston	10/84		Gr 9	R S	
TX	South Cavalcade Street	Houston	10/84	6/86	415	V F	
TX	Stewco, Inc.	Waskom	10/84	6/86	193	R F	O
TX	Texarkana Wood Preserving Co.	Texarkana	4/85	6/86	384	R	O
TX	Triangle Chemical Co.	Bridge City	12/82	9/83	764	R	O
TX	United Creosoting Co.	Conroe	9/83	9/84	462	R F	O
	22 Final + 4 Proposed = 26 Total Sites						
UT	Hill Air Force Base	Ogden	10/84	7/87	Gr 4F	R	I
UT	Midvale Slag	Midvale	6/86		Gr 12	D	
UT	Monticello Rad Contaminated Props	Monticello	10/84	6/86	538	R	I
UT	Ogden Defense Depot	Ogden	10/84	7/87	Gr 6F	R	
UT	Olson/Neihart Reservoir	Wasatch County	10/84		Gr 12	R	
UT	Portland Cement (Kiln Dust 2 & 3)	Salt Lake City	10/84	6/86	113	V S	
UT	Rose Park Sludge Pit *	Salt Lake City	10/81	9/83	99	V	C
UT	Sharon Steel (Midvale Tailings)	Midvale	10/84		Gr 1	R	
UT	Tooele Army Depot (North Area)	Tooele	10/84		Gr 9F	R	
UT	Wasatch Chemical Co. (Lot 6)	Salt Lake City	1/87		Gr 1	V R F S	O
	5 Final + 5 Proposed = 10 Total Sites						
VA	Atlantic Wood Industries, Inc.	Portsmouth	6/86		Gr 8	D	

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			Date				
St	Site Name	City/County	Proposed or Announced[1]	Final	Rank/ Group[2]	Response Category[3]	Cleanup Status[4]
VA	Avtex Fibers, Inc.	Front Royal	10/84	6/86	524	V F	
VA	C & R Battery Co., Inc.	Chesterfield County	1/87	7/87	238	R	I
VA	Chisman Creek	York County	10/81	9/83	219	R	
VA	Culpeper Wood Preservers, Inc.	Culpeper	10/84		Gr 6	V F	
VA	Defense General Supply Center	Chesterfield County	10/84	7/87	Gr 12F	R	O
VA	Dixie Caverns County Landfill	Salem	1/87		Gr 12	D	
VA	First Piedmont Quarry (Route 719)	Pittsylvania County	4/85	7/87	721	D	
VA	Greenwood Chemical Co.	Newtown	1/87	7/87	133	R	
VA	H & H Inc., Burn Pit	Farrington	1/87		Gr 9	D	
VA	IBM Corp. (Manassas Plant Spill)	Manassas	10/84		Gr 7	V F	I
VA	L.A. Clarke & Son	Spotsylvania County	10/84	6/86	564	R F	
VA	Love's Container Services Lndfll	Buckingham County	4/85		Gr 8	D	
VA	Matthews Electroplating *	Roanoke County	10/81	9/83	92	R	O
VA	Rentokil, Inc. (VA Wood Pres Div)	Richmond	1/87		Gr 14	D	
VA	Rhinehart Tire Fire Dump	Frederick County	10/84	6/86	706	V R F	O
VA	Saltville Waste Disposal Ponds	Saltville	12/82	9/83	737	V R S	O
VA	Saunders Supply Co.	Chuckatuck	1/87		Gr 3	D	
VA	U.S. Titanium	Piney River	12/82	9/83	545	V F S	O
	11 Final + 8 Proposed = 19 Total Sites						
VT	Old Springfield Landfill	Springfield	12/82	9/83	543	V F	O
VT	Pine Street Canal *	Burlington	10/81	9/83	88	D	
	2 Final + 0 Proposed = 2 Total Sites						
WA	American Lake Gardens	Tacoma	9/83	9/84	758	V R F	I
WA	Bangor Ordnance Disposal	Bremerton	10/84	7/87	Gr 15F	R	
WA	Colbert Landfill	Colbert	12/82	9/83	356	V R	O
WA	Com Bay, Near Shore/Tide Flats	Pierce County	10/81	9/83	347	R F S	
WA	Com Bay, South Tacoma Channel	Tacoma	10/81	9/83	111	V R F S	O
WA	FMC Corp. (Yakima Pit)	Yakima	12/82	9/83	413	F	
WA	Fort Lewis (Landfill No. 5)	Tacoma	10/84	7/87	Gr 12F	R	
WA	Frontier Hard Chrome, Inc.	Vancouver	12/82	9/83	60	R	
WA	Greenacres Landfill	Spokane County	9/83	9/84	759	R	
WA	Harbor Island (Lead)	Seattle	12/82	9/83	556	F	
WA	Hidden Valley Lf (Thun Field)	Pierce County	6/86		Gr 6	S	
WA	Kaiser Aluminum Mead Works	Mead	12/82	9/83	435	V	
WA	Lakewood Site	Lakewood	12/82	9/83	321	R	O
WA	McChord AFB (Wash Rack/Treatment)	Tacoma	10/84	7/87	Gr 7F	R	
WA	Mica Landfill	Mica	10/84	6/86	552	D	
WA	Midway Landfill	Kent	10/84	6/86	118	S	O

National Priorities List,
Final and Proposed Sites (by State)
July 1987

St	Site Name	City/County	Date Proposed or Announced$_1$	Date Final	Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
WA	Nav Air Sta, Whid Is. (Ault)	Whidbey Island	9/85		Gr 4F	R	
WA	Nav Air Sta, Whid Is. (Seaplane)	Whidbey Island	9/85		Gr 9F	R	
WA	Nav Undersea Warf Stat (4 Areas)	Keyport	6/86		Gr 13F	R	
WA	Northside Landfill	Spokane	10/84	6/86	760	R	O
WA	Northwest Transformer	Everson	10/84	6/86	590	R	O
WA	Old Inland Pit	Spokane	6/86		Gr 15	D	
WA	Pesticide Lab (Yakima)	Yakima	12/82	9/83	743	D	
WA	Queen City Farms	Maple Valley	9/83	9/84	562	V	O
WA	Silver Mountain Mine	Loomis	10/84	6/86	727	R	O
WA	Toftdahl Drums	Brush Prairie	10/84	6/86	383	R	O
WA	Western Processing Co., Inc.	Kent	7/82	9/83	48	V R F S	O
WA	Wyckoff Co./Eagle Harbor	Bainbridge Island	9/85	7/87	635	F	
	23 Final + 5 Proposed = 28 Total Sites						
WI	Algoma Municipal Landfill	Algoma	6/86	7/87	391	D	
WI	City Disposal Corp. Landfill	Dunn	9/83	9/84	471	F S	
WI	Delavan Municipal Well #4	Delavan	9/83	9/84	754	S	
WI	Eau Claire Municipal Well Field	Eau Claire	9/83	9/84	512	R	
WI	Fadrowski Drum Disposal	Franklin	10/84	6/86	688	D	
WI	Hagen Farm	Stoughton	9/85	7/87	647	S	
WI	Hunts Disposal Landfill	Caledonia	6/86	7/87	691	D	
WI	Janesville Ash Beds	Janesville	9/83	9/84	64	F	
WI	Janesville Old Landfill	Janesville	9/83	9/84	61	F	
WI	Kohler Co. Landfill	Kohler	9/83	9/84	308	V	
WI	Lauer I Sanitary Landfill	Menomonee Falls	9/83	9/84	314	S	
WI	Lemberger Landfill, Inc.	Whitelaw	9/85	6/86	575	S	
WI	Lemberger Transport & Recycling	Franklin Township	9/83	9/84	557	R	
WI	Master Disposal Service Landfill	Brookfield	9/83	9/84	213	R	
WI	Mid-State Disposal, Inc. Landfill	Cleveland Township	9/83	9/84	532	R	
WI	Moss-American(Kerr-McGee Oil Co.)	Milwaukee	9/83	9/84	641	R F	
WI	Muskego Sanitary Landfill	Muskego	9/83	9/84	154	F	
WI	National Presto Industries, Inc.	Eau Claire	10/84	6/86	325	D	
WI	Northern Engraving Co.	Sparta	9/83	9/84	414	V F	
WI	Oconomowoc Electroplating Co. Inc	Ashippin	9/83	9/84	664	R	
WI	Omega Hills North Landfill	Germantown	9/83	9/84	49	S	
WI	Onalaska Municipal Landfill	Onalaska	9/83	9/84	324	R	
WI	Schmalz Dump	Harrison	9/83	9/84	190	R	
WI	Scrap Processing Co., Inc.	Medford	9/83	9/84	565	S	
WI	Sheboygan Harbor & River	Sheboygan	9/85	6/86	592	D	
WI	Spickler Landfill	Spencer	1/87	7/87	283	D	
WI	Stoughton City Landfill	Stoughton	10/84	6/86	495	D	

National Priorities List,
Final and Proposed Sites (by State)
July 1987

St	Site Name	City/County	Date Proposed or Announced$_1$	Date Final	Rank/ Group$_2$	Response Category$_3$	Cleanup Status$_4$
WI	Tomah Armory	Tomah	1/87	7/87	702	D	
WI	Tomah Fairgrounds	Tomah	1/87	7/87	629	D	
WI	Tomah Municipal Sanitary Landfill	Tomah	6/86		Gr 5	D	
WI	Waste Research & Reclamation Co.	Eau Claire	9/83	9/84	642	S	
WI	Wausau Ground Water Contamination	Wausau	4/85	6/86	751	R	0
WI	Wheeler Pit	La Prairie Township	9/83	9/84	69	S	
	32 Final + 1 Proposed = 33 Total Sites						
WV	Fike Chemical, Inc.	Nitro	12/82	9/83	490	F	0
WV	Follansbee Site	Follansbee	12/82	9/83	594	V F	I
WV	Leetown Pesticide	Leetown	12/82	9/83	477	V R	0
WV	Mobay Chemical (New Martinsville)	New Martinsville	10/84		Gr 5	V F	
WV	Ordnance Works Disposal Areas	Morgantown	10/84	6/86	503	F	
WV	West Virginia Ordnance *	Point Pleasant	10/81	9/83	89	V F	0
	5 Final + 1 Proposed = 6 Total Sites						
WY	Baxter/Union Pacific Tie Treating	Laramie	12/82	9/83	464	V F S	0
	1 Final + 0 Proposed = 1						
	802 Final + 149 Proposed = 951						

National Priorities List,
Final and Proposed Sites Per State/Territory
(by New Final Sites)
July 1987

State/Territory	New Final		Total Final		Total Proposed		
	Non-Fed	Fed	Non-Fed	Fed	Non-Fed	Fed	Total
California	6	8	40	8	15	0	63
Pennsylvania	12	1	60	1	17	2	80
Wisconsin	6	0	32	0	1	0	33
New York	5	1	62	1	4	0	67
New Jersey	3	2	94	2	3	1	100
Washington	1	3	20	3	2	3	28
Virginia	3	1	10	1	8	0	19
Minnesota	3	1	39	1	0	0	40
North Carolina	3	0	9	0	2	0	11
Illinois	1	2	15	2	8	2	27
Delaware	3	0	12	0	5	1	18
Utah	0	2	3	2	4	1	10
Tennessee	1	1	8	1	1	0	10
South Carolina	2	0	12	0	3	0	15
Oklahoma	1	1	5	1	0	0	6
Missouri	0	2	12	2	5	0	19
Michigan	2	0	58	0	11	0	69
Florida	2	0	34	0	5	0	39
Arkansas	2	0	9	0	1	0	10
Texas	0	1	21	1	3	1	26
Oregon	0	1	4	1	1	0	6
Ohio	1	0	28	0	2	0	30
New Hampshire	1	0	13	0	0	0	13
Nebraska	0	1	2	1	2	0	5
Montana	1	0	8	0	1	0	9
Maryland	1	0	7	0	0	2	9
Maine	0	1	5	1	1	0	7
Louisiana	1	0	6	0	1	1	8
Kentucky	1	0	10	0	0	0	10
Kansas	1	0	7	0	1	0	8
Iowa	1	0	7	0	6	0	13
Indiana	1	0	24	0	5	0	29
Georgia	0	1	3	1	3	0	7
Connecticut	1	0	7	0	1	0	8
Colorado	0	1	12	1	1	1	15
Arizona	1	0	6	0	3	0	9
Alabama	0	1	8	1	0	1	10
Wyoming	0	0	1	0	0	0	1
West Virginia	0	0	5	0	1	0	6
Virgin Islands	0	0	0	0	0	0	0
Vermont	0	0	2	0	0	0	2

National Priorities List,
Final and Proposed Sites Per State/Territory
(by New Final Sites)
July 1987

State/Territory	New Final Non-Fed	 Fed	Total Final Non-Fed	 Fed	Total Proposed Non-Fed	 Fed	Total
Trust Territories	0	0	0	0	0	0	0
South Dakota	0	0	1	0	0	0	1
Rhode Island	0	0	8	0	0	0	8
Puerto Rico	0	0	8	0	0	0	8
North Dakota	0	0	1	0	0	0	1
New Mexico	0	0	4	0	0	0	4
Nevada	0	0	0	0	0	0	0
Mississippi	0	0	2	0	0	0	2
Massachusetts	0	0	21	0	0	0	21
Idaho	0	0	4	0	0	0	4
Hawaii	0	0	0	0	6	0	6
Guam	0	0	1	0	0	0	1
District of Columbia	0	0	0	0	0	0	0
Commonwealth of Marianas	0	0	0	0	0	0	0
American Samoa	0	0	0	0	0	0	0
Alaska	0	0	0	0	0	0	0
Total	67	32	770	32	133	16	951

National Priorities List,
Final and Proposed Sites Per State/Territory
(by Total Sites)
July 1987

State/Territory	Final Non-Fed	Final Fed	Proposed Non-Fed	Proposed Fed	Total
New Jersey	94	2	3	1	100
Pennsylvania	60	1	17	2	80
Michigan	58	0	11	0	69
New York	62	1	4	0	67
California	40	8	15	0	63
Minnesota	39	1	0	0	40
Florida	34	0	5	0	39
Wisconsin	32	0	1	0	33
Ohio	28	0	2	0	30
Indiana	24	0	5	0	29
Washington	20	3	2	3	28
Illinois	15	2	8	2	27
Texas	21	1	3	1	26
Massachusetts	21	0	0	0	21
Virginia	10	1	8	0	19
Missouri	12	2	5	0	19
Delaware	12	0	5	1	18
South Carolina	12	0	3	0	15
Colorado	12	1	1	1	15
New Hampshire	13	0	0	0	13
Iowa	7	0	6	0	13
North Carolina	9	0	2	0	11
Utah	3	2	4	1	10
Tennessee	8	1	1	0	10
Kentucky	10	0	0	0	10
Arkansas	9	0	1	0	10
Alabama	8	1	0	1	10
Montana	8	0	1	0	9
Maryland	7	0	0	2	9
Arizona	6	0	3	0	9
Rhode Island	8	0	0	0	8
Puerto Rico	8	0	0	0	8
Louisiana	6	0	1	1	8
Kansas	7	0	1	0	8
Connecticut	7	0	1	0	8
Maine	5	1	1	0	7
Georgia	3	1	3	0	7
West Virginia	5	0	1	0	6
Oregon	4	1	1	0	6
Oklahoma	5	1	0	0	6
Hawaii	0	0	6	0	6

National Priorities List, Final and Proposed Sites Per State/Territory (by Total Sites) July 1987

State/Territory	Final		Proposed		
	Non-Fed	Fed	Non-Fed	Fed	Total
Nebraska	2	1	2	0	5
New Mexico	4	0	0	0	4
Idaho	4	0	0	0	4
Vermont	2	0	0	0	2
Mississippi	2	0	0	0	2
Wyoming	1	0	0	0	1
South Dakota	1	0	0	0	1
North Dakota	1	0	0	0	1
Guam	1	0	0	0	1
Virgin Islands	0	0	0	0	0
Trust Territories	0	0	0	0	0
Nevada	0	0	0	0	0
District of Columbia	0	0	0	0	0
Commonwealth of Marianas	0	0	0	0	0
American Samoa	0	0	0	0	0
Total	770	32	133	16	951

SITES DELETED FROM THE NPL AS OF 3/31/88

ORIGINAL FIVE DELETIONS:

1. Chemical Minerals, OH EPA Region 5
2. Gratiot County Golf Course, MI EPA Region 5
3. Luminous Processes, GA EPA Region 4
4. Welcott Chemical, MS EPA Region 4
5. Chemical Metals, MD EPA Region 3

FY86 DELETIONS:

Notice of Intent to Delete: Federal Register / Vol. 50, No. 251 / 12/31/85
Notice of Deletion: Federal Register / Vol. 51, No. 45 / 3/7/86

1. Enterprise Avenue, Philadelphia, PA EPA Region 3
2. Friedman Property, Upper Freehold, NJ EPA Region 2
3. Lehigh Electric and Engineering Co., Old Forge Borough, PA EPA Region 3
4. Morris Arsenic Dump, Morris, MN EPA Region 5
5. PCB Spills, 243 miles of roads, NC EPA Region 4
6. PCB Warehouse, Saipan, Commonwealth of the Northern Mariana Islands EPA Region 9
7. PCB Wastes, Trust Territories of the Pacific Islands EPA Region 9
8. Taputimu Farm, Island of Tutuila, American Somoa EPA Region 9

FY88 DELETIONS:

Notice of Intent to Delete: Federal Register / Vol. 52, No. 171 / 9/3/87
Final Notice submitted to AA, OSWER for signature

1. Middletown Road Dump, Annapolis, MD EPA Region 3
2. Harris (Farley Street), Houston, TX EPA Region 6
3. Mountain View Mobile Home Estates, Globe, AZ EPA Region 9

Notice of Intent to Delete: Federal Register / Vol. 53, No. 49 / 3/14/88

1. Tri-City Oil Conservationist, Tampa, FL Region 4
2. Varsol Spills, Miami, FL Region 4

SITES DELETED FROM THE NPL AS OF 3/31/88 (continued)

FY88 DELETIONS (continued):

Notice of Intent to Delete: received AA, OSWER concurrence 3/31/88, no FR notice to date

1. Matthews Electroplating, Roanoke County, VA Region 3
2. Presque Isle, Erie, PA Region 3
3. A.L. Taylor, Brooks, KY Region 4
4. Mowbray Engineering, Greenville, KY Region 4
5. Galloway Pits, Galloway, TN Region 4
6. Newport Dump, Newport, KY Region 4
7. Lee's Lane, Louisville, KY Region 4

SUMMARY:

Deleted Sites*	Notice of Intent	AA, OSWER Concurrence
13	3	9

*The Butler Tunnel site was included in the original deletions and was reinstated to the NPL on 7/21/87

Mr. **Gallo.** If I can deal with a little parochial interest, the State of New Jersey has the dubious distinction of having the most recorded Superfund sites. I think that's for a number of reasons. One, we have been very active, "we", being the State of New Jersey, the governor, and the DEP have been very forceful in its seeking out Superfund and hazardous waste sites.

One of the things that we have been told is that some of the dates that we have been given, have not been met due to a lack of expertise either during the evaluation process, meaning the consultants going in and evaluating the Superfund sites, or the recommendations that come out of those sites from the consultants or engineers, trying to find the proper mechanism to alleviate the problem.

Do you feel that there is enough expertise around this country to be able to handle the sites that we're dealing with and has this problem impeded your efforts to meet the schedules that have been set?

Mr. **Thomas.** There are a number of things that key those sites, and some of the things you used talked about. I talked about those records of decision.

For instance, the sites in New Jersey, some of them are some of the more complex sites that we've found anywhere in the kind of contamination, the kind of remedies that may be required at those sites. Many of those remedies, and many of what we are dealing with at the sites are both complex and controversial from a technical point of view and a public point of view.

Working through those issues and trying to come to a conclusion on them in some cases has taken longer than we anticipated or the State of New Jersey anticipated, but we do seem to be able to work through most of them. We continue to make progress toward final solutions at the sites in New Jersey.

I must commend New Jersey as well for having probably the most aggressive program in terms of State action, and I think we work well with the State officials in overall cleanup.

The issue of expertise, whether it's ours or whether it's contract terms, is one that we constantly have to be concerned about. When you're dealing with new technology, when you're dealing with trying new technology, you want to insure that the kind of expertise that you have is credible and capable.

I think both in the agency and in contractors we've got good expertise, but it's constantly something I think that we have to look to as new technology is being developed, as new techniques are being tried.

Mr. **Gallo.** As you know, a number of our sites happen to be former landfills. At least one of the explanations that has been given to me is when you're dealing with one chemical compound, it's one thing to make an evaluation as to how you would remove that or the hazard from the site, but when you mix one chemical with four or five other chemicals, you are not quite sure what the reaction is going to be or how to clear it up. Therefore, it makes the cleanup a much more difficult task. Is that——

Mr. **Thomas.** I think clearly that's the case. At many of these sites we find we're dealing with many, many chemicals in compound mixtures.

Mr. Gallo. Just one more question: I've asked your Agency for a schedule updating the work that's going to be done on those sites within the State of New Jersey, and I can tell you that your staff has always been very responsive to our requests, but those dates that we're now given, are they fairly accurate dates as far as either starts or work——

Mr. Thomas. I feel they are probably are. Each year we do an action plan for the year. It's updated quarterly as we go through and look at the action. It breaks down a site by the various stages and when actions will actually take place.

I think we've got a fairly good schedule in New Jersey as far as accuracy, don't you think?

Mr. Porter. Yes. We work very closely with Dick Dewling and his people on those. I think we have a good schedule.

I will make one quick editorial comment, which I think is the whole subject of this hearing. The main delay in most New Jersey sites, in most all of them anywhere, is the selection of remedy. If that were easy and everybody agreed on it, we'd be in great shape, but those are often contentious debates.

I have been to the Lipari site and to many other places in your State, and there's a lot of dialogue on those remedies. We just have to keep chipping away at it.

Mr. Gallo. Well, I just want to commend you, Mr. Thomas, and your staff. You've got a very difficult job. There's a great deal of anxiety in dealing with many of these Superfund sites based on the fear of contamination to underground water supplies. I think you're doing your best. Certainly the dollars are there now. If we have the expertise, I think we can see some movement.

I want to thank the chairman and I want to thank Nancy Johnson again for allowing me to go before her.

Mr. Oberstar. Thank you, Mr. Gallo.

One point that I want to raise, Mr. Thomas, before going on to Mrs. Johnson is what appears to be happening with the process you've already described is that EPA has created a cycle of relocation. People create the waste at a generation site, whether it's an industry or a manufacturing process. It's moved to a dumpsite. It's removed from the dumpsite to another location, maybe then further treated, burned or dumped into the atmosphere under certain circumstances, creating, in effect, a cycle of relocation and not permanent destruction of the material.

Mr. Thomas. I don't think that's the case, Mr. Chairman. Clearly, that's a charge that's been made, and there was a charge that we debated during reauthorization of the program. There's no question that at a number of sites, particularly with the removal program, you will see us clean up, collect, and take offsite to a commercial facility, a commercial hazardous waste facility, material. That commercial facility may be an incinerator and it may be a land disposal facility.

We follow very stringent guidelines in the agency. Those were actually, many of them, incorporated into the statute when you reauthorized it under our offsite policy, to insure that, in fact, what we are doing is not taking waste from an uncontrolled situation to another situation that may become a problem.

There's no question that in the early days of the program I don't think we were as vigilant as we are today in insuring that that doesn't happen. I don't think that the movement of waste is such that we're somehow just going through a checkerboard process of moving the waste from one place to the other at all.

Mr. **Oberstar**. We will hear more about that from the OTA report.

The gentlewoman from Connecticut?

Mrs. **Johnson**. Thank you very much, Mr. Chairman.

I appreciate, Mr. Thomas, the good work of you and your Agency on this matter. We did give you a very complicated law, a very extensive new body of law to implement 18 months ago, and we did it at a time when you were just beginning to get the first law up and running.

I think it's important to recall that history because I believe that in light of that history you've done really remarkably well, and you can't do that without dedicated people who will put in the hours to make the decisions that have to guide this kind of program.

But there are a lot of good reasons for this hearing, and I appreciate my chairman's leadership in calling it. There are a couple of things that I would like to touch on.

First of all, you made the statement earlier to my colleague, Mr. Rowland, that you could not be moving forward if it had not been for the indemnity authority in the law. Did I understand that correctly?

Mr. **Thomas**. That's correct. I think that the kind of problems we've got in the country, many of which I think you are familiar with as far as the availability of insurance, the environmental impairment liability insurance. The concern that some of the contractors, many of the contractors, have about whether they would become jointly and severally liable if they went in, even under a contract with us, to clean up a Superfund site, prompted many of those contractors to indicate that they would not move forward and do work for us at those sites unless the Government embodied in our programs indemnified them from that kind of future liability.

One, they didn't think they should be liable; they're going in to clean it up. But, two, they were concerned about how the law was written, how broad it was. Three, they did not feel like they would be able to obtain the insurance to cover that liability because of the availability of insurance.

Mrs. **Johnson**. It was that we clarified their liability, narrowed their liability, and indemnified their liability that enabled you to move forward? I think that's very important for the committee to be conscious of because the issue that follows from that is, What happens out there in the private sector to companies that do not have the protection of those constraints nor the support of the indemnification provisions?

You made the comment to Mr. Rowland that you thought the insurance was available. I would disagree with you on that. We had only one company apply to be that kind of carrier in Connecticut, and they finally have withdrawn. I have literally no source of part B insurance for anybody with a part B RCRA permit in Connecticut.

Unless you're a big enough company like United Technologies to insure yourself, I don't know what we are going to do. So far, your agency has taken a fairly rational approach to the seriousness of the crisis, but we've even had court settlements in Connecticut that say you must meet the requirements of the law, but if you can't in fact, because it isn't available, then there's a grand vagueness going on.

I do not believe it's responsible for government to leave people hanging out there under the purview of a law that one cannot comply with. I do want any information you have on the availability of insurance issue.

Mr. THOMAS. I agree with you, Mrs. Johnson, about the seriousness of that issue. I didn't mean to imply at all that I thought there was general EIL insurance available. In some cases we see insurance available, but it's largely supplemental.

For instance, like our indemnification is partial indemnification so insurance may be available to supplement that indemnification, but it is still, I think, a very narrow market as far as what is available out there for environmental impairment.

Mrs. JOHNSON. How narrow? My understanding is that it's so narrow that it's zero.

Mr. THOMAS. In some cases I think not available.

Mrs. JOHNSON. That's right.

The other problem is that your agency cannot say that a particular insurance policy is or is not adequate under the law. Why is that?

Mr. PORTER. Can I respond, Mrs. Johnson?

Mrs. JOHNSON. Yes.

Mr. PORTER. There are two or three issues here. One, we do have some additional information we're going out with respect to RCRA on this. Again, we're trying desperately to broaden what is acceptable as far as financial assurance or capability or other sorts of things.

Lee is right, though, and you're right in the sense that some of these things are just not available. The latest thing is underground storage tanks. We're finding the small companies—the large companies can self-insure and/or get insurance, but we're simply seeing in underground storage tanks, for example, there is not available insurance for the small companies. We're trying desperately within the law—and some would disagree on our interpretation—but within the law to see if we can buy more time and also make our definitions as broad as possible.

It's just a real difficult problem.

Mrs. JOHNSON. And you anticipated my second question, which was insurance in regard to tank owners.

Mr. PORTER. Yes.

Mrs. JOHNSON. I think we need to pursue this issue. I don't know whether we can afford to pursue it all now. But the fact is that the law still requires insurance to demonstrate financial responsibility, and the fact is that there isn't any insurance.

In December of my first term, and I first started serving in 1903, I tried desperately to get legislation through that would at least make you legal if you had tried to get this insurance and you were meeting all of the environmental requirements of the law, so you weren't polluting, you weren't damaging the environment.

I failed for a variety of reasons, the primary one of which was that the bill got to the Senate in those last three days before Christmas recess when anyone can put a stop on it, and certain people believe in putting stops on all bills as a matter of principle.

But we have not been able to come back and revisit the issue. My understanding is that your Agency was going to try to evaluate how many companies were out there providing insurance and, at my request, was going to also review how many companies who claimed that they had insurance—because, after all, they only had to claim it as of the application data for a part B permit did, in fact, have insurance that was still good, that hadn't expired.

I think that we still need that information: how many people who have part B permits actually do have insurance and how many people have met all part B requirements except the insurance, so that we can see the dimensions of this problem, and likewise with the tank owners?

It is really imperative that we do something about the fact that we have ordinary citizens in a democracy out there subject to criminal penalties for violating a law that there is no possibility for them to comply with because there is nothing on the market.

On the issue of figures, who's got what and what do your files show?

Mr. PORTER. Mrs. Johnson, maybe I should update you in writing because we're coming down to the last year on the RCRA part B permits. The land disposal permits are to be done by November 1988. As a matter of fact, it looks like we're going to get them done, but there are about 300 people that are on the home stretch to get permits. About 150 have already been done with; about 150 to go.

I will update you on the status of who's falling out of the system for reasons only of insurance.

What we have found as we have moved through the RCRA system is that oftentimes we find someone couldn't get insurance, but we also find there may be other reasons why they are not going to get a permit. So it's not been a veay clean universe of these 10 companies or these 20 or these 50 that they've done everything impeccably, they're perfectly on track, everything is fine except for getting insurance. There are a few of those, but there are also a number of others that have dropped out for other reasons—not wanting to put the monitoring wells in, a variety of examples.

I will update you on the status of insurance availability and also update you just in general on who has this kind of insurance.

Mr. THOMAS. Including that related to the underground storage tanks.

Mr. PORTER. Exactly.

Mrs. JOHNSON. Yes, I would appreciate that. I think that would be very useful, and perhaps we will be able to follow up on that some other time.

Mr. OBERSTAR. Please provide that information for the committee as well as to Mrs. Johnson. We'll include it at this point in the record.

Mr. PORTER. Thank you.

[The following was received from Mr. Porter:]

Attachment A is a list of insurance companies that offer Environmental Liability Insurance to RCRA treatment, storage and disposal facilities. This list does not include all insurance companies that will offer this insurance. There are companies, other than those that are listed that will issue environmental liability insurance coverage, but would not consent to be listed on the RCRA docket. The Agency is gathering information from owner/operators on their experiences in obtaining liability coverage to meet RCRA requirements. Attached is a copy of the cover letter and questionnaire that is being sent out to collect this information.

With regard to RCRA Part B permits, the attached letter (Attachment B) to Congresswoman Johnson dated June 5, 1987 is the most recent information that we have regarding facilities that were unable to qualify for permits because they were unable to meet the liability coverage requirements.

Below is the list of known providers of insurance for Underground Storage Tanks (USTs)—

1. Petromark, a risk retention group
2. Federated Mutual
3. Pollution Liability Insurance Association (PLIA)—PLIA is an insurance pool of 14 companies
4. Oilman's Fund

The first three provide most of current coverage; petroleum marketers, expecially oil jobbers and chain operators, are the ones being covered. Single service station dealers and non-petroleum marketers (e.g., truck fleets) have the most difficulty getting coverage. The larger companies (e.g., petroleum refiners) are self-insured.

Attachment A

9300 Lee Highway
Fairfax, Virginia
22031-1207

703/934-3000

ICF INCORPORATED

MEMORANDUM March 17, 1988

TO: Carlos Lago, OSW

FROM: Elaine Blatt, Mark Atlas

SUBJECT: Insurance Companies that Provide Liability Coverage to RCRA Facilities

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This memo updates ICF's March 6, 1987, memo, "Insurance Companies that Provide EIL Coverage to RCRA TSDFs."

Background

On several previous occasions, ICF conducted a telephone survey of insurance companies that had been known in the past to offer Environmental Impairment Liability (EIL) insurance to determine if they were still supplying such coverage. The results of the most recent such survey were submitted to EPA on March 6, 1987. At that time, four insurance companies agreed to be listed in the RCRA docket as firms that supply EIL coverage (see Attachment 3). Three other companies indicated that they offered EIL coverage, but did not want to be listed in the docket.

As you requested, we have recently repeated the telephone survey, recontacting the seven companies known through last year's survey to be offering EIL coverage, as well as six additional companies that were thought to be potential sources of EIL coverage for RCRA facilities. In addition to the questions asked in last year's survey (see Attachment 4), the following questions were asked:

- Are there any special underwriting requirements that are prerequisites for obtaining EIL coverage?
- Are there any facility types for which the insurance company will not provide EIL coverage under any circumstances?
- Does the insurance company's EIL policy include narrow or laser exclusions for pre-existing conditions?
- For risk retention groups, what capital contribution is required to join the group?

Attachment 2 summarizes our conversations with contacts from insurance companies and risk retention groups.

Results

This year's survey identified five additional insurance companies or risk retention groups willing to offer EIL coverage.[1] Four of these companies agreed to be listed in the RCRA docket (see Attachment 1 for the complete docket listing). One insurer that indicated last year that it offered coverage but declined to be listed in the docket, Continental Corporation, reported this year that it has discontinued its EIL program. None of the companies currently listed in the docket asked to be removed.

The results of this year's survey could be an indication that the market for EIL coverage is beginning to broaden. The five newly identified EIL insurers generally represent programs that have been developed in the last one to two years, rather than existing programs that previously were unknown to the Agency. There also are other indications of an expanding market. American Home Assurance and National Union Fire Insurance have both increased their policy limits from $12.5 million to $15 million this year due to their increased capacity. Liberty Mutual, which previously covered only facilities that handle hazardous waste as an incident to their standard operations, now considers covering facilities directly involved in hazardous waste management.

An expansion of the EIL market does not, however, necessarily indicate that insurance coverage is becoming readily available. Survey results also suggest that the market for EIL coverage, particularly coverage for RCRA treatment, storage and disposal facilities (TSDFs), continues to be limited. One company, Travelers, indicated that it has lowered its coverage limits from $1 million to $500,000. Several of the insurers interviewed offer EIL coverage that would be inadequate to demonstrate financial responsibility under Subtitle C, and some offer coverage only to firms not engaged primarily in the management of hazardous waste. In addition, two of the five new insurers identified in this year's survey have not yet begun writing policies, and Hypercept, which last year indicated that it would begin offering policies on May 1, 1987, is now projecting that its first policies will be offered on July 1, 1988. While the emergence of new EIL insurance programs may indicate an expanding market, the limited operating history of these programs makes it difficult to determine at this time whether such programs will become a significant source of EIL coverage for RCRA TSDF owners and operators in the future.

This survey may not have identified all companies that may offer EIL coverage to RCRA TSDF owners and operators. Other companies, similar to several of those interviewed, may only offer coverage to customers already purchasing other lines of insurance from them. Such companies do not actively market policies. The survey was limited to companies known to us to be offering or developing EIL coverage. Other companies may be developing coverage programs or may have recently entered the market, and companies not known to us may currently offer coverage.

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[1] These five insurance companies are: Environmental Compliance Services, Environmental Insurance Management, Environmental Protection Insurance Company, Ranger Insurance, and United Coastal Insurance.

Attachments

ATTACHMENT 1

COMPANIES OFFERING EIL COVERAGE AS OF MARCH 8, 1988 AND AGREEING TO BE LISTED IN THE DOCKET

The following list includes the names of insurance companies and risk retention groups that have agreed to be included on the RCRA docket list as companies currently offering environmental impairment liability (EIL) coverage to treatment, storage, and disposal facilities (TSDFs). All information is based on the results of a telephone survey of insurance companies known to be offering or planning to offer such coverage. Several qualifications, however, are relevant to this list.

First, this list does not include all companies that offer this type of coverage. The Agency is continuing to contact additional insurance companies and will update this list as more information becomes available. Second, the company contacts listed below are not necessarily the persons who were interviewed during the telephone survey. Third, the EIL policies currently written by some of these companies do not necessarily satisfy the RCRA regulations. Finally, inclusion on this list does not guarantee that the company will provide a policy to any particular firm owning or operating a TSDF. Moreover, the availability of coverage from any of the companies listed below is subject to change.

American Home Assurance Company[1]
70 Pine Street
7th Floor
New York, New York 10270
Robert Patterson, Manager, Pollution Legal Liability Department
(212) 770-7144
Member, American International Group

Environmental Compliance Services, Inc. (ECS)
721 East Lancaster Ave.
Downingtown, Pennsylvania 19334
Kathleen M. Lackey, Marketing Coordinator
(215) 269-6731
Member, American International Group

Environmental Protection Insurance Company (EPIC)[2] (a risk retention group)
Shand, Morahan, and Company, Inc.
Shand Morahan Plaza
Evanston, Illinois 60201
Kent Jagmin or Chuck North
(312) 866-2800

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[1] Writes policies only for Canadian firms that own or operate hazardous waste facilities in the United States.

[2] EPIC is in the developmental stage, but plans to begin writing policies on April 1, 1988.

Hypercept Insurance Pool[3] (a risk retention group)
217 Broadway
Monticello, New York 12701
Dr. Charles P. Priesing, President, Aralie Inc. (201) 694-7896, or
Allan Bader, Executive Vice President, Aralie Inc. (516) 623-9176
(800) 431-1270, ext. 8201 (marketing office)

Liberty Mutual Insurance Company[4]
175 Berkeley Street
Boston, Massachusetts 02117
Contact one of Liberty Mutual's regional sales offices directly
(617) 357-9500 (corporate headquarters)

National Union Fire Insurance Company
70 Pine Street
7th Floor
New York, New York 10270
Robert Patterson, Manager, Pollution Legal Liability Department
(212) 770-7144
Member, American International Group

Ranger Insurance Company
P.O. Box 2807
Houston, Texas 77252-2807
Karen Kinser, Manager, Casualty Department, Ranger Allied Underwriters
(713) 622-6500
Member, Pollution Liability Insurance Association

United Coastal Insurance Company
One Corporate Center
Hartford, Connecticut 06103
Frank Craemer
(203) 560-1670

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[3] Hypercept is in the developmental stage, but plans to begin writing policies on July 1, 1988.

[4] Writes policies only for customers that carry other coverage with it.

ATTACHMENT 2

SUMMARIES OF CONVERSATIONS WITH COMPANIES THAT OFFER EIL INSURANCE

1. Companies That Have Agreed To Be Listed In The Docket

A. Companies already listed that have agreed to remain listed

American Home Assurance Company (Member, American International Group)

(212) 770-7144
70 Pine Street
7th Floor
New York, New York 10270
Telephone Contact: Bill McElroy, Underwriter
Contact for Policy Information: Robert Patterson, Manager, Pollution Legal Liability Department
Coverage Limits: Combined, $15 million per occurrence/$15 million annual aggregate.[1]
Legal Defense Costs: Usually included within policy limits, but will write policies with defense costs outside policy limits if necessary to comply with RCRA; if paid outside policy limits, defense costs are capped at 25 percent of the aggregate limit.
First Dollar Coverage: Generally no, but will write policies to conform to RCRA requirements with a self-insured retention of $100,000.
State Restrictions: Will not write policies in Idaho, Michigan, or Vermont.

Comments: This company writes policies only for Canadian risks. If a Canadian company owns or operates a TSDF located in the United States, coverage will be provided through an American Home Assurance policy. An American TSDF owner or operator that obtains EIL coverage from the American International Group (AIG) will have its coverage provided through a National Union Fire Insurance Company policy (see below). The company will consider covering all facilities except service stations and transporters, but is studying the possibility of offering coverage to service stations. Due to its increased capacity, the company raised its coverage limits from $12.5 million to $15 million this year. Also, the company began to offer coverage to cleanup contractors at limits of $1 million per occurrence/$5 million annual aggregate. Risk assessments, paid for by the insured, are required before a policy becomes effective. Based on these risk assessments, narrow exclusions are written into the policy to exclude from coverage any existing releases. The company has offered EIL coverage since 1980.

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[1] Except where indicated, coverage is for third-party bodily injury and property damage, and on-site cleanup. On-site coverage may be limited, however, to cleanup ordered by the government or approved by the insurer to mitigate third-party claims (see Comments section for each insurer).

Hypercept Insurance Pool (Aralie Incorporated and the Rhulen Agency)

(800) 431-1270, ext. 8201
217 Broadway
Monticello, New York 12701
Telephone Contact: Dr. Charles P. Priesing, President; Aralie Incorporated, 8 Williams Street; Pequannock, New Jersey, (201) 694-7896
Contact for Policy Information: Dr. Charles P. Priesing, President, Aralie Incorporated or Allan Bader, Executive Vice President, Aralie Incorporated (516) 623-9176, or (800) 431-1270, ext. 8201
Coverage Limits: Will initially offer combined coverage at $1 million per occurrence/$2 million annual aggregate, raising limits incrementally as more capital is accumulated; eventually plans to offer limits of $3 million per occurrence/$6 million annual aggregate.
Legal Defense Costs: Included within policy limits.
First Collar Coverage: Yes, with a $2,500 to $25,000 deductible that would be reimbursable to Hypercept.
D
State Restrictions: None yet (see Comments below).

Comments: The Hypercept Insurance Pool, a risk retention group, does not yet write policies, but plans to begin issuing policies on July 1, 1988. The pool is being marketed by Aralie Incorporated, an environmental and insurance consulting firm, and the Rhulen Agency, an agency that markets specialty lines insurance. The pool is targeting small- to medium-sized companies with chemical manufacturing risks (i.e., companies that handle hazardous waste, toxic substances, and other dangerous materials that would be regulated under RCRA or TSCA). Coverage is intended for those manufacturers for whom the management of hazardous waste is incidental to their day-to-day business. The pool is not intended for commercial hazardous waste facilities. Hypercept will write policies for petroleum underground storage tanks, provided that the tanks meet special underwriting requirements, including tank tightness testing. Potential insureds must complete an extensive application and agree to comply with Hypercept's risk management program in order to obtain coverage. The pool will provide a preliminary quote based on the application. A site risk assessment is then performed and a final quote is given based on assessment results. Hypercept was licensed in Tennessee on August 13, 1987, and as a risk retention group should, based on its Tennessee licensing, be eligible to write policies in all States. However, it is possible that some States will not accept Hypercept policies without requiring the pool to meet further requirements. The minimum premium charged by Hypercept will be $25,000, and the required capital contribution will be three times the premium, with one-third payable in cash and the other two-thirds payable through a letter of credit.

Liberty Mutual Insurance Company

(617) 357-9500
175 Berkeley Street
Boston, Massachusetts 02117
Telephone Contact: Joan Moreau, Staff Assistant, General Liability
Contact for Policy Information: Contact one of Liberty Mutual's regional sales offices directly
Coverage Limits: Combined, $6 million per occurrence/$6 million annual aggregate; occasionally higher based on specific risk.
Legal Defense Costs: Covered outside policy limits in most cases.
First Dollar Coverage: Yes.
State Restrictions: None.

Comments: Offers coverage only to companies that carry other liability coverage with Liberty Mutual, particularly general liability coverage. The company will consider offering EIL coverage to a firm that is willing to switch all of its coverage to Liberty Mutual, but the company's capacity to offer such coverage is limited. The company will consider coverage for all facility types, including underground storage tanks. This represents a change from last year, when the company would not consider writing policies for firms dealing exclusively with hazardous waste. Liberty Mutual has offered EIL coverage since 1984.

National Union Fire Insurance Company (Member, American International Group)

(212) 770-7144
70 Pine Street
New York, New York 10270
Telephone Contact: Bill McElroy, Underwriter
Contact for Policy Information: Robert Patterson, Manager, Pollution Legal Liability Department
Coverage Limits: Combined, $15 million per occurrence/$15 million annual aggregate.
Legal Defense Costs: Usually included within policy limits, but will write policies with defense costs outside policy limits if necessary to comply with RCRA; if paid outside policy limits, defense costs are capped at 25 percent of the aggregate limit.
First Dollar Coverage: Generally no, but will write policies to conform to RCRA requirements with a self-insured retention of $100,000.
State Restrictions: Will not write policies in Idaho, Michigan, or Vermont.

Comments: Offers coverage only for American risks. Coverage is identical to that provided by American Home Assurance discussed above.

B. Companies not previously listed that have agreed to be listed

Environmental Compliance Services, Inc. (ECS) (Member, American International Group)

(215) 269-6731
721 East Lancaster Ave.
Downingtown, Pennsylvania 19335
Telephone Contact: Joanne Fitzgerald, Marketing Department
Contact for Policy Information: Kathleen M. Lackey, Marketing Coordinator
Coverage Limits: Combined, $1 million per occurrence/$2 million annual aggregate for third-party damages only.
Legal Defense Costs: Usually included within policy limits, but will write policies with defense costs covered outside policy limits if necessary to comply with RCRA; if paid outside policy limits, defense costs are capped at 25 percent of aggregate limits.
First Dollar Coverage: Yes, if necessary to conform to RCRA requirements; deductible amounts vary and are reimbursable to ECS.
State Restrictions: None.

Comments: ECS is a managing general agency for Reliance National Risk Specialists, with responsibility for underwriting and administering a program of insurance for the hazardous waste and materials industry. The company will consider supplying coverage to all hazardous waste facility owners and operators but will not cover underground storage tanks. In addition, the company sells policies insuring cleanup contractors, and is in the process of developing policies for mobile treatment units and facilities handling low-level radioactive waste. The company also offers coverage to chemical distributors and transporters of hazardous material. Firms wishing to obtain coverage must first undergo a rigorous underwriting process.

Environmental Protection Insurance Company (EPIC) (Shand, Morahan, and Company, Inc.)

(312) 866-2800
Shand, Morahan, and Company, Inc.
Shand Morahan Plaza
Evanston, Illinois 60201
Telephone Contact: Kent Jagmin, (312) 866-0810
Contact for Policy Information: Kent Jagmin or Chuck North
Coverage Limits: Will initially offer combined, $1 million per occurrence/$2 million annual aggregate for third party damages only; coverage intended to be increased up to $5 million per occurrence/$10 million annual aggregate.
Legal Defense Costs: Included within policy limits.

First Dollar Coverage: No; minimum deductible will be $50,000.
State Restrictions: None at this time.

Comments: EPIC, a risk retention group, is still in the process of capitalizing, but plans to begin issuing policies on April 1, 1988. EPIC policies will be underwritten by Shand, Morahan, and Company, Inc. Alexander and Alexander, an insurance broker, is also involved in administering the program. The group plans to offer coverage to owners and operators of TSDFs, but will not cover Superfund sites, contractors, or consulting engineers. Coverage for underground storage tanks is also excluded, but may be "bought back" as an endorsement. Facilities must undergo a risk assessment before coverage is provided and the assessment must be done by a risk assessment firm approved by EPIC. If coverage for underground storage tanks is being provided, tanks to be covered must undergo tightness testing. Firms wishing to join EPIC must make a one time capital contribution approximately equal to the annual premium. EPIC is licensed as a risk retention group in Illinois.

Ranger Insurance Company (Member, Pollution Liability Insurance Assoc.[2])

(713) 622-6500
P.O. Box 2807
Houston, Texas 77252-2807
Telephone Contact: Ray Knickman
Contact for Policy Information: Karen Kinser, CPCU, CPIW; Manager, Casualty Department; Ranger Allied Underwriters
Coverage Limits: Follow PLIA directives.
Legal Defense Costs: Follow PLIA directives; varies by State.
First Dollar Coverage: Yes, with reimbursable deductible; amount of deductible varies.
State Restrictions: Will not write policies in Tennessee; generally depends on PLIA directives.

Comments: Ranger is reinsured for pollution coverage through PLIA (Ranger recently rejoined PLIA). The company will consider writing policies for firms that do not carry all of their coverage with Ranger. Ranger probably would not provide coverage to a firm dealing exclusively with hazardous waste, but is willing to consider coverage for firms for which handling hazardous waste is incidental to the firms' primary operations. Potential insureds must meet PLIA underwriting requirements. Ranger's policies will not cover on-site cleanup except where mandated by the government or to mitigate a third-party claim.

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[2] PLIA is a pool of insurance companies which collectively reinsures the pollution risks of its member companies. All members share in the gains and losses of the group, and because pollution risks are shared through the pool, member companies wishing to write a policy for a particular pollution risk must obtain approval from the pool.

United Coastal Insurance Company

(203) 560-1670
One Corporate Center
Hartford, Connecticut 06103
Telephone Contact: Frank Craemer
Contact for Policy Information: Frank Craemer
Coverage Limits: $1 million per occurrence/$2 million annual aggregate for sudden accidental releases only.
Legal Defense Costs: Cap on coverage of costs outside limits; when cap is reached, defense costs are counted against policy limits.
First Dollar Coverage: No; deductible amount varies.
State Restrictions: No coverage offered in Maine, New Hampshire, Vermont, Tennessee, and Idaho.

Comments: United Coastal offers this line of coverage only to RCRA facilities (the company also provides coverage for asbestos abatement and removal contractors). The company covers only very well run facilities, and insureds must meet strict underwriting standards. A risk assessment is required before the policy becomes effective; the cost of the assessment is sometimes borne by the insured, sometimes by United Coastal. The company will not cover underground storage tanks.

2. Companies That Do Not Wish To Be Included In The Docket

Environmental Insurance Management, Inc. (EIM)

(703) 893-0900
7900 Westpark Drive, Suite A300
McLean, Virginia 22102
Telephone Contact: Myra Anderson, Legislative Representative
Contact for Policy Information: William P. Gulledge, Vice President
Coverage Limits: Will initially offer combined, $1 million per occurrence/$1 million annual aggregate in the fall of 1988.
Legal Defense Costs: Uncertain how defense costs will be handled.
First Dollar Coverage: Yes.
State Restrictions: None as yet.

Comments: EIM is currently seeking investors for an insurance company that will write specialty coverage for environmental risks. The first policy that EIM intends to offer would cover underground storage tanks. Eventually, the company intends to provide EIL coverage to manufacturers and retailers with pollution risks (e.g., dry cleaners). Because of the amount of capital involved, the company believes it will be several years before it could consider offering coverage to owners or operators of TSDFs. Policies will only cover third-party damages, with an EIM option to cover on-site cleanup in order to avert or mitigate third party loss. Tanks to be insured must undergo tightness testing.

Travelers Insurance Company

(203) 277-4140
One Tower Square-10MN
Hartford, Connecticut 06183-4030
Telephone Contact: Ed Rineheimer, Secretary
Contact for Policy Information: Ed Rineheimer, Secretary
Coverage Limits: Combined, $500,000 per occurrence/$500,000 annual aggregate.
Legal Defense Costs: Covered outside policy limits, but subject to an additional limit.
First Dollar Coverage: Yes, with reimbursable deductible.
State Restrictions: Has recently withdrawn from market in some States where there has been difficulty with the claims-made policy.

Comments: Travelers does not intend to be an insurer of professional waste organizations (including TSDFs and generators of large amounts of hazardous waste), but may provide pollution coverage as part of a total package of comprehensive casualty insurance for a company. Travelers offers policies only to companies that carry other coverage with them. Travelers will cover some service stations with new underground storage tanks; otherwise, its coverage is limited to firms with very minimal risk. Generally, no risk assessment is required as a condition of coverage. Travelers has recently lowered its coverage limits from $1 million per occurrence/$1 million annual aggregate to $500,000 per occurrence/$500,000 annual aggregate.

U.S. Fire Insurance Company (Member, Pollution Liability Insurance Assoc.)

(201) 292-5606
211 Mt. Airy Road
Basking Ridge, New Jersey 17920
Telephone Contact: Joseph McGrath, Casualty Underwriting Office
Contact for Policy Information: Richard Rice, Vice President, Casualty (201) 953-3357
Coverage Limits: Follow PLIA directives.
Legal Defense Costs: Sometimes included in policy limits; for policies covering cleanup costs, defense costs are generally included in policy limits.
First Dollar Coverage: Yes, with reimbursable deductible.
State Restrictions: Depends on PLIA directives, but generally no restrictions.

Comments: U.S. Fire is reinsured for pollution coverage through PLIA. U.S. Fire writes very little pollution coverage, and writes it only for established accounts on an accommodation basis. In addition, even for those accounts that qualify for pollution coverage, U.S. Fire will insure only risks on the "low end of the hazard spectrum." Because the company is reinsured completely for pollution coverage through PLIA, PLIA has final authority on which companies can be insured.

ATTACHMENT 3

COMPANIES OFFERING EIL INSURANCE
AS OF MARCH 4, 1987

The following list includes the names of insurance companies that have agreed to be included on the RCRA docket list as companies currently offering environmental impairment liability (EIL) coverage to treatment, storage and disposal facilities (TSDFs). All information is based on results from a series of telephone surveys of insurance companies, including companies that have previously offered coverage to TSDFs and members of the Pollution Liability Insurance Association (PLIA). A number of points should be noted about this list.

First, although this list was based on a number of surveys, it does not include all companies that offer this type of coverage. The Agency is continuing to contact additional insurance companies and will update this list as more information becomes available. Second, the company contacts listed below are not necessarily the people who were interviewed during the telephone surveys. Third, the EIL policies currently being written by these companies do not necessarily satisfy the RCRA regulations. Finally, inclusion on this list does not guarantee that the company will provide a policy to any particular firm owning a TSDF. Moreover, the availability of coverage from any of the companies listed below is subject to change.

American Home Assurance Company[1]
70 Pine Street
7th Floor
New York, New York 10270
Robert Patterson, Manager, Pollution Legal Liability Dept.
(212) 770-7144
Member, American International Group

Hypercept Insurance Pool[2]
Aralie Incorporated
8 Williams Street
Pequannock, New Jersey 07440
Dr. Charles P. Priesing, President (201) 694-7896, or
Allan Bader, Executive Vice President (516) 623-9176

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[1] Writes policies only for Canadian firms that operate hazardous waste facilities in the United States.

[2] Insurance pool is still in the developmental stage, but intending to offer coverage beginning May 1, 1987.

Liberty Mutual Insurance Company[3]
175 Berkeley Street
Boston, Massachusetts 02117
John W. Purkis, Vice President
(617) 357-9500

National Union Fire Insurance Company
70 Pine Street
New York, New York 10270
Robert Patterson, Manager, Pollution Legal Liability Dept.
(212) 770-7144
Member, American International Group

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[3] Offers policies only to accounts that carry other coverage with them.

ATTACHMENT 4

QUESTIONS ASKED IN PREVIOUS SURVEY

- Does the company still offer EIL coverage to TSDFs?
- Who is the company contact for policy information?
- What are the limits for sudden and nonsudden coverage?
- Are legal defense costs included in or excluded from the coverage limits?
- Does the policy include first dollar coverage?
- Are there certain States in which the company will not write EIL policies?
- Is coverage available only on an accommodation basis, i.e., must a firm carry all of its other coverage with the insurance company as a condition of obtaining an EIL policy?
- If a firm was willing to switch all of its coverage, would the insurance company consider writing an EIL policy for the firm?
- Will the insurance company agree to be listed in the RCRA insurance docket? (The docket list emphasizes that the listing of a company does not guarantee that coverage would be provided for any particular firm.)

Attachment B

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 9 1987

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Honorable Nancy Johnson
House of Representatives
Washington, D.C. 20515

Dear Ms. Johnson:

This is a follow-up to your letter of March 18, 1987 that requested information about thermal destruction. I have surveyed the Regional offices to obtain information that was not available for our initial response.

You requested a list of Federal facilities where thermal destruction has been recommended for use, and the volume and type of hazardous materials present. There are no Federal facilities where thermal destruction has been recommended to date by EPA under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Federal facilities that are interim status facilities with some type of incinerator under the Resource Conservation and Recovery Act (RCRA) were included with our initial response.

You also requested a list of sites where consent decrees or administrative actions have ordered or suggested thermal destruction for cleanup. In addition to the CERCLA sites listed in our initial response (i.e., Hyde Park, NY; Westinghouse, IN; and Laskin Poplar, OH), such sites include:

Bennett Stone Quarry, IN
Lemon Lane Landfill, IN
Neals Landfill, IN
Enviro Chem, IN
Seymour, IN
Neals Dump, IN
Motco, TX
ASARCO, WA

In general, please note that RCRA orders do not suggest or recommend cleanup methods.

Finally, you asked for a list of corrective action recommendations or site closures where thermal destruction has been recommended. Sites where thermal destruction has been selected as the remedy under CERCLA were included in our initial response. To date, to the best of our knowledge, thermal destruction has not been recommended under RCRA for corrective action or site closure.

I hope this information is useful in your investigation. Please do not hesitate to contact me if you have any further questions.

Sincerely,

Win Porter

J. Winston Porter
Assistant Administrator

Mrs. **Johnson**. Thank you, Mr. Chairman.

Also, will you make sure that that information—and I don't know what your applications are, but I want to be sure that whatever company claims insurance has insurance that's in force for whatever life. I mean, what is it required to cover? Is it required to cover as of the time of application, as of the time of application plus a year? How are we monitoring that?

Mr. **Porter**. We'll address that.

[The following was received from Mr. Porter:]

The Agency is aware that operating facilities that are on the NPL find it difficult or impossible to qualify for liability insurance. The Agency will delete sites from the NPL only when it determines that no further response is appropriate. In making this determination EPA considers the following criteria:

(1) EPA in consultation with the state has determined that responsible or other parties have implemented all appropriate response actions required;

(2) All appropriate fund-financed response under CERCLA has been implemented, and EPA, in consultation with the state, has determined that no further cleanup by responsible parties is appropriate; or

(3) Based on remedial investigation, EPA, in consultation with the state, has determined that the release poses no significant threat to public health or the environment, and therefore, remedial measures are not appropriate.

In addition EPA has "delisted" 44 RCRA facilities that had been proposed for the NPL but had not been listed. These RCRA sites will undergo cleanup under RCRA and/or enforcement action under RCRA or CERCLA. Only if they are shown to be unwilling or unable to perform corrective action could they be placed on the NPL.

Mrs. **Johnson**. Then, I'm going to come back to my other questions, Mr. Chairman, because I, like you, have some questions about technology and what research is being done to develop technology that might substitute for incineration, which is clearly from the information you have given us today extraordinarily expensive.

Also, I want to come back to the deletion issue because originally Superfund was to deal with abandoned sites, but you're not dealing only with abandoned sites; you are also dealing with sites of operating companies. Therefore, it raises the issue of how do you get off of the list, because if you don't get off the list, you can never get insurance. If you can't get insurance, you have to go out of business.

It's very important that we talk a little bit more about your deletion process, and I'm pleased to see that you have accomplished some deletions.

Thank you.

Mr. **Oberstar**. The Chair recognizes the gentleman from Maryland, Mr. Cardin.

Mr. **Cardin**. Thank you, Mr. Chairman. I appreciate your recognizing me here today. I want to compliment you for holding these oversight hearings on the Superfund law. It's extremely important to our country and very important to the district that I represent.

Mr. Thomas, if I might, I would like to follow up somewhat on the first comment that was made by Mrs. Bentley, the fire that took place in Fells Point just a few days ago, which came very close to destroying the Allied Chemical chrome plant that's a hazardous waste site.

If that fire would have spread, we would have had to evacuate a part of Baltimore due to the chrome-asbestos pollution that is there if the fire would have gotten that far.

I want to compliment your agency and your people in Philadelphia for the work that they're doing with us. I know it's a private company that's responsible for the removal, but EPA has a very direct involvement in carrying it out to make sure that it is done as promptly as possible.

I guess my first point that I would just like to emphasize: we know what needs to be done. We know the building has to be taken down and removed. We know we have to encase the land that's around there. We know what is in store. I would just urge you to please use your good office, if you could, to make sure we stay on track to move that project to completion as quickly as possible, so that we have the State, EPA, and the private company working in concert together. I would appreciate your taking the lead on that.

Mr. THOMAS. We'll certainly do that, Mr. Cardin.

Mr. CARDIN. If I might ask you a question in regard to a hearing that took place with the Water Resources Subcommittee of this committee in Baltimore in regard to the Chesapeake Bay and toxic pollution within the Bay, that hearing pointed out very clearly that we have two major tasks: one, to stop additional toxic pollution, but also to take a look at the sediments and do something, if we can, to improve the water quality through the treatment of the sediments either through capping or removal.

I understand that perhaps the Superfund rating system is changing somewhat to take a look at submerged sites as potentials for Superfund cleanup. I wish, if you would, you would comment on that process.

Mr. THOMAS. Congressman, we have dealt with in the Superfund program in some cases contamination in harbors and estuaries. We deal with that actually beyond the Superfund program in other authorities. This committee has jurisdiction, for instance, over our water quality authority, which is a good example of authorities that we have under our Great Lakes program. Actually we have a number of toxic hot spot projects in our Great Lakes program we are working on now, where we are looking at not only identification of the toxic hot spots, but remedial actions to try to take care of those toxic hot spots.

It is both our broad authority as far as water quality is concerned under the Clean Water Act as well as some of the authorities under Superfund that you could anticipate that the agency would look to as far as an issue like contaminated bottom sediments.

The Chesapeake Bay is an example of an estuary where that will be a part of the issue, ultimate cleanup of Chesapeake Bay. It's part of the issue in the Great Lakes. It's a part of the issue in many of our other bays and estuary programs we're working on.

I think what you should anticipate is that probably we will be looking at most of the authority and most of the emphasis for dealing with those bottom contaminants through our Clean Water Act authorities and estuary programs as opposed to the Superfund program. The Superfund program we often are trying to deal with and rank a series of sites where we're trying to deal with a source and a release to the environment. Oftentimes we're dealing with that in a priority fashion that is directly affecting, or may directly affect, human health.

We are expanding to a certain extent, as you indicated, the criteria we use, and we're looking at food chain impact. So you can anticipate under Superfund some broadening which could incorporate some of the kind of things you're concerned about in the Chesapeake Bay from bottom sediments.

But I think that overall I'd say that probably most of the action is going to be under our Clean Water Act and under our estuary program as far as the Clean Water Act is concerned.

Mr. **CARDIN**. We have one particular project in Middle Branch where there is quite a bit of toxic sediments. The plans for that region have called for much more use, public use, of the area surrounding that where the toxic sediments have a direct impact on whether we will be able to carry that forward. I believe that will be looked at by you under the clean water estuary programs.

Mr. **THOMAS**. That's correct.

Mr. **CARDIN**. I appreciate that.

Thank you, Mr. Chairman.

Mr. **OBERSTAR**. Thank you, Mr. Cardin.

I understand, Mr. Thomas, that you have some other commitments. Your staff will remain here. I think it's important now that we move to the OTA presentation. I would like your people to remain available to hear the testimony. We will question OTA and then come back to EPA for responses.

Mrs. **JOHNSON**. Mr. Chairman, would you yield for a moment?

Mr. **OBERSTAR**. Yes.

Mrs. **JOHNSON**. I didn't realize we weren't going to go to a second round of questions. I thought your——

Mr. **OBERSTAR**. We will have a second round of questions after we have heard OTA.

Mrs. **JOHNSON**. Okay. All right. I am very concerned about the community right-to-know provisions and what's happening to that information, and is it uniform enough, and can it be managed.

Mr. **THOMAS**. We will be happy to respond——

Mr. **OBERSTAR**. We're going to have a complete, leisurely review.

Mr. **THOMAS**. Thank you, Mr. Chairman.

Mr. **OBERSTAR**. Thank you very, very much.

[Mr. Thomas' prepared testimony follows:]

STATEMENT OF LEE M. THOMAS
ADMINISTRATOR
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT
COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION
U.S. HOUSE OF REPRESENTATIVES

APRIL 20, 1988

Good morning, Mr. Chairman and members of the Subcommittee. It is a pleasure to be here today to discuss the Environmental Protection Agency's (EPA's) implementation of the Superfund Program. With me are Dr. J. Winston Porter, Assistant Administrator for Solid Waste and Emergency Response, Henry Longest, Director of the Office of Emergency and Remedial Response, and John Cannon, Director of the Office of Waste Programs Enforcement.

I will begin with an overview of how the Superfund Program works, stressing our efforts and accomplishments since passage of the Superfund Amendments and Reauthorization Act of 1986, or SARA. I will then discuss some issues relating to our Record of Decision (ROD) process, which I know is of particular interest to the Subcommittee, and, finally, mention some initiatives we have developed to improve our implementation process.

The first and most important point to stress in connection with the Superfund Program is that its sheer magnitude and complexity make it not only a major environmental undertaking but a dramatic management challenge. SARA did not merely extend an already complicated program -- it also increased its size and scope, set new goals and standards for cleanup, expanded the role of States and citizens in decision making, and strengthened our existing enforcement policies.

Although I will not go into them in this statement, I should also point out that the massive scale of our program is further increased by the roles that SARA assigns to other Federal agencies, which require considerable additional efforts at cooperation and coordination on our part.

We have had two major objectives since passage of SARA -- to regain and increase the momentum of the program that was lost during the uncertainties of the reauthorization process and to implement expeditiously our new responsibilities under the Act. In both areas, we have tried to navigate a careful course between the need for rapid cleanup and the need to spend our funds wisely and effectively. We are trying to move quickly, while establishing procedures that will ensure high quality results. We are generally pleased with our efforts to date, but, as I will discuss later, there are some areas where we seek to improve our performance.

CURRENT PROCESS AND PROGRESS

Three types of actions are possible under the Superfund response program: removal actions, remedial actions, and enforcement actions. Let me begin with one of the greater successes of Superfund implementation, our removal program.

Removal Actions

Removal actions are short-term actions intended to stabilize or clean up an incident or site threatening human health and welfare or the environment. Since the initiation of Superfund, we have undertaken over 1,000 removal actions, 350 since passage of SARA alone. I might add that some removals are quite extensive, involving significant engineering efforts and requiring several million dollars to complete. SARA encourages the expanded use of removals by increasing our authority to take complex and costly removal actions. One of our key priorities is to use this new authority to solve a greater portion of the problem at a Superfund site through direct removal action.

Remedial Actions

Remedial actions are longer term actions that are generally undertaken at more complex sites. They usually require more time than removal actions, involve more extensive study to select the most effective option, and may cost millions of dollars to implement. They may consist of removal and treatment (such as incineration) of contaminated materials, pumping and treating of ground water, or other actions to clean up a site permanently.

For these complex cases of site contamination, we use a more extensive process involving the following steps:

* Maintenance of an inventory of potential Superfund sites called "CERCLIS." This inventory currently contains over 27,000 sites.
* The conduct of preliminary assessments (PA's) and site inspections (SI's) in order to decide which locations are serious enough to warrant Superfund expenditures. To

date, over 26,000 PA's and 8,000 SI's have been carried out -- 6081 PA's and 1814 SI's since passage of SARA alone.

- Based on information gathered in the SI, a site is scored using the Hazard Ranking System (HRS). If the site scores above 28.5, it may be proposed for the National Priorities List (NPL). If a responsible party fails to perform the necessary cleanup, a proposed or final NPL site may receive remedial action funding from the Superfund. Currently, there are 951 sites either proposed for or on the NPL.
- A remedial investigation/feasibility study (RI/FS) is conducted for sites that are proposed for or on the NPL. SARA requires that 275 RI/FS's be started in the first three years after passage, and we have already begun 156. RI/FS's may be conducted directly by EPA or by potentially responsible parties (PRP's).
- After the RI/FS, EPA selects a remedial action for the site. This selection is documented in a Record of Decision (ROD). Since enactment of SARA, 111 ROD's have been completed.
- Next, based on the ROD, the remedial design (RD) and remedial action (RA) are carried out. Since inception of the program, 190 RD's and 144 RA's have been initiated.
- Thirteen sites were deleted from the NPL prior to SARA; three have been proposed for deletion in the Federal Register, and nine more are ready to propose for deletion.

Site work has been completed at an additional 10 sites, with longer term operations and maintenance activities continuing.

Enforcement and Cost Recovery

One of the other key elements of the Superfund Program is the use of our enforcement authorities to compel cleanup or to seek reimbursement for cleanups financed by the Fund itself. Since the resources available to the Fund are limited in comparison to the number of potential sites in need of cleanuup, the ability to compel private party efforts or to recover our costs is critical to the success of the program. Section 107 of CERCLA authorizes recovery of response costs incurred by the government from potentially responsible parties (PRP's). It is our policy to seek recovery of all costs involved, including site-specific costs, enforcement costs, indirect costs, and interest.

Section 106 authorizes the government to compel PRP's to take actions at sites to reduce the threat of an imminent and substantial endangerment. Our policy is to seek settlements with PRP's requiring them to undertake the necessary work at a site, subject to proper oversight. This preserves the Fund for sites where PRP's with sufficient assets cannot be located. If a settlement cannot be reached, we use Fund monies for the cleanup and seek to recover them after cleanup has been completed.

The enforcement program has resulted in commitments for work from PRP's in excess of $700 million at over 400 sites so far, and cost recovery actions have been referred to the Department of Justice for $257 million, resulting in settlements worth approximately $69 million.

As I will discuss in more detail later, one of our major priorities under SARA is to increase the number of settlements where work is carried out directly by PRP's. Success in this will increase our ability to use the Fund where there are no financially viable PRP's available.

Title III

One of the major new responsibilities placed upon EPA by SARA is Title III, which has two main purposes: (1) encouraging and supporting emergency planning at State and local levels of government for chemical accidents; and (2) providing local governments and the public with information about potential chemical hazards in their communities. To support these goals, the Act requires development of a framework at State and local levels and requires facilities to submit certain information on potential chemical hazards and releases. By law, that information generally is to be available to interested citizens.

Although Title III is mainly a State and local program, we have taken several steps to provide leadership, guidance, and assistance to those responsible for implementation, including:

* Encouraging the successful establishment of State Emergency Response Planning Commissions in all 50 States, Puerto Rico, the Virgin Islands, and the District of

Columbia, and over 3,000 Local Emergency Planning Commissions, with more still being formed;

* Completing seven rulemakings, each of which reduced reporting burdens from statutory baselines while protecting public safety;
* Issuing two guidance documents to assist local communities in their planning;
* Submitting an interim report to Congress on the status of emergency systems;
* Providing technical guidance to industry on performing emissions inventory estimates;
* Working with the Federal Emergency Management Agency to award $5 million in training grants to States in each of Fiscal Years 1987 and 1988; and
* Conducting an extensive public outreach program to inform industry and others responsible for implementation, as well as the public, of chemical emergency preparedness, prevention, and community right-to-know requirements.

This year, the Title III program will support the development of local emergency response plans due in 1988. The State and local level planning structure will be put in place, and mechanisms for data management will be developed. Training, technical assistance, and review of local plans will continue to be provided by our EPA Regions. In addition, we are developing a national data base to make information on emissions available to the public. This information will be submitted annually to EPA and the States, beginning in July, 1988.

Working with other Federal agencies, we will also begin implementing our Title III enforcement program with the States, complete the emergency systems review, and continue developing a chemical accident prevention program.

Leaking Underground Storage Tanks Trust Fund

We have another major new responsibility under SARA, created by Congress as a result of public concern over leaking underground storage tanks. The law complements our regulatory program established under the Hazardous and Solid Waste Amendments of 1984 and establishes a trust fund supported by environmental taxes. Using this new trust fund, EPA is empowered to provide the States with funds to seek owner or operator cleanup, or where the owner or operator is unwilling or unable, to initiate corrective actions and seek recovery of the costs incurred.

We have some major accomplishments to date, including the proposal of final regulations for tank technical standards, financial responsibility, and State program approval. In addition, we have developed policies and procedures to support implementation of the Leaking Underground Storage Tank Trust Fund (LUST). Our primary goal has been to build effective State and local programs through creating a program that will be adaptable and realistic in the 50 States and 3,000 communities where it will be implemented.

Under our regulations, which we expect to become effective in the Fall of 1988, States will be able to begin submitting their programs for EPA approval during Fiscal Year 1989. We have already negotiated 46 cooperative agreements with 43 States and 3 territories, and 2 site-specific agreements in the course of carrying out our duties.

Research and Development

We are also progressing in our attempts to stimulate and support the research and development necessary for supporting our Superfund tasks. For example, under our Superfund Innovative Technology Evaluation (SITE) program, we provide private and public entities with an opportunity to test and evaluate new and alternative technologies for dealing with the hazardous substances found at Superfund sites. We currently have 21 demonstration projects under way, with field work completed at 5 of them. The results should help us find appropriate technologies for meeting SARA's cleanup standards.

In addition, our Office of Research and Development, supported by our Superfund Office, has been providing technical assistance to our Regions for solving Superfund technical problems, and we have been soliciting and selecting for funding proposals for various Superfund research grants relating to monitoring at Superfund sites and in situ treatment of hazardous waste.

We are also in the process of establishing five university-based Hazardous Substance Research Centers, which will conduct research on the manufacture, use, transportation, disposal, and management of hazardous substances.

Regulations, Policies, and Guidances

Finally, I should point out that all these accomplishments have required the preparation of dozens of new or revised regulations, policies, and guidances. For example, in the months immediately following passage of SARA, we completed key guidance documents, including one relating to legally applicable or relevant and appropriate standards (ARAR's) for cleanup, one on selection of remedies at Superfund sites, and one on streamlining the process for reaching settlements with PRP's.

We have also published, prepared, or will be coming out with major regulations soon, including a new Hazard Ranking System, the National Contingency Plan (which is the blueprint for response and cleanup), and Technical Assistance Grants.

RECORDS OF DECISION

The Subcommittee expressed special interest in our ROD's as a possible indicator of the degree of consistency with which particular remedies or technologies are or can be used across the spectrum of sites requiring cleanup. This is an area where we must balance the need for consistency of approach throughout our Regions and the need for flexibility in responding to widely varying physical, hydrological, and geographical conditions from site to site.

Since passage of SARA, we have completed 111 ROD's, with those signed in recent months covering a wide range of remedies and technologies. Currently, our guidance instructs EPA decision makers to consider the following nine elements in selecting the remedy which forms the basis of a ROD:

(1) Overall protection of human health and the environment;

(2) Compliance with ARAR's;

(3) Reduction of toxicity, mobility, and volume;

(4) Long-term effectiveness and permanence;

(5) Short-term effectiveness;

(6) Ease or difficulty of implementation;

(7) Capital and operational costs;

(8) Community attitudes and acceptance; and

(9) State acceptance.

These criteria are to be considered in comparing all the major options. Protectiveness and compliance with ARAR's are threshold requirements that all remedies must achieve. The remaining criteria must be balanced, based on the conditions which appear most important at a given site.

Considering all factors, the overall ability to implement the preferred remedy is also a key concern. We do not believe it is wise to select a remedy that cannot be implemented because of a State's inability to provide the 10% cost share, strenuous public opposition, or unwillingness of the responsible parties to agree to a settlement. Because this is such a challenging issue, we will continue to examine our criteria over time, and we would welcome the Subcommittee's thoughts as to the proper balance to strike between consistency, flexibility, and innovation.

AREAS WHERE IMPROVEMENTS ARE UNDER WAY

As we have gained experience in implementing the original Superfund program and in responding to the newer challenges of

SARA, we have felt a need to change, strengthen, or rethink some aspects of our managerial processes. As a result, we are moving forward to improve project management, reform our Alternative Remedial Contract Strategy, expedite our RI/FS process, and streamline our settlement process.

Project Management

In the past, a number of different contractors were involved in the conduct of remedial work at a Superfund site -- for example, one to do the RI/FS, another to do the detailed engineering design under the management of the Army Corps of Engineers, and yet another to actually construct the remedy.

We will now attempt to cut back on the time involved in these "handoffs" through a project management approach under which one firm provides overall technical direction of a cleanup. This approach, which is typical of much private and public engineering work, should show benefits through greater efficiency and accountability. The major individual phases of cleanup work can be accomplished by one firm or organization with proven expertise in project management. Specialized work and opportunities for smaller businesses can be obtained through subcontracts from the project management firm.

The Alternative Remedial Contract Strategy

We are currently implementing an Alternative Remedial Contract Strategy (ARCS), which will encourage greater competition among firms through increasing the number of contractors supporting the Superfund program. We hope to award more work to those who are best moving projects forward while still maintaining quality.

This initiative is consistent with our new project management approach. Prime contractors will be selected for each of seven separate contracting zones and will operate as project managers, ultimately accountable for all work conducted at a site (although they may subcontract some work).

Competition will be increased further by selection of multiple prime contractors within each zone (and there are more zones than under our earlier procedures, which allows smaller firms to bid by decreasing the size of the contracts).

We will, however, continue to use the Army Corps of Engineers for design and construction management work where appropriate.

Remedial Investigations/Feasibility Studies

The RI/FS is basic to successful completion of a remedy at a site, and we hope to enhance the pace and quality of the program through improvements in the RI/FS development process. We have three objectives: (1) contain project planning to a three-month period; (2) reduce the overall process to an eighteen month schedule; and (3) reduce overall project costs.

To achieve these objectives, we are initiating four major improvements:

- Phased RI/FS Execution, which involves using the results of initial field investigations to better define the needs of subsequent phases;
- Streamlined Project Planning, which includes consolidating sampling and analysis plans and quality assurance project

plans, incorporating standard procedures by reference, and limiting formal review of documents;

- *Management of Handoffs*, (shifting responsibilities for review activities), which can be minimized by scheduling concurrent activities, receiving interim approvals for activities, and phasing tasks; and
- *Establishment of a Quality Control and Technical Advisory Committee*, which will serve to identify and resolve major technical and policy issues in the RI/FS and will assist in ensuring that the scope and costs are communsurate with the level of complexity of the site.

We hope and expect that these initiatives will permit us to move forward more rapidly to signature of ROD's and actual completion of site cleanup.

Enforcement: Expediting the Settlement Process

I wish to conclude this portion of my testimony by stressing again the critical importance we attach to the effective use of our enforcement authorities to obtain settlements from PRP's. Good settlements both expedite direct cleanup by PRP's and preserve the Fund for use at other sites. Moreover, good settlements in cost recovery actions recoup monies for the Fund. Because, as I mentioned earlier, government cleanup funding is likely to be insufficient to meet cleanup needs, the enforcement program, in a very real sense, is the sine qua non of successful Superfund and SARA implementation.

We have been working closely with our Regions to see that they are better prepared as they enter into negotiations with PRP's, and we are developing procedural mechanisms to speed up the settlement process. We are also urging the Regions to make more vigorous use of some of the tools provided by SARA to expedite settlements, including especially:

* Mixed Funding -- Our goal is to secure 100% of the remedial costs from PRP's. However, through the Mixed funding concept, EPA may accept PRP offers of less than 100% in order to settle quickly and sue later for the remainder from non-settling PRP's. Mixed funding occurs when we "mix" Superfund monies with PRP payments to finance a cleanup;
* De minimis Cash-Out -- EPA may allow de minimis PRP's, those with a very minor contribution at a site, to "cash out" and leave the process early when this could help to speed the process. We developed interim guidance on the use of de minimis cash-out last year; and
* Nonbinding Preliminary Allocations -- SARA allows us, at our discretion, to provide a nonbinding preliminary allocation of responsibility (NBAR) where it may facilitate settlement.

Special negotiation procedures with responsible parties are appropriate in some cases, and we can also provide a further incentive to settle through agreeing to provide PRP's with a release in the form of a covenant not to sue, if certain conditions are met.

It is also critical to pursue vigorous action against recalcitrant PRP's to give further encouragement to those considering settlement. To facilitate quick action, we are developing a guide that specifically addresses criteria for selecting among the available options when negotiations fail. The options include issuing an administrative order followed by judicial referral under section 106 of CERCLA, issuing an administrative order followed by Fund-financed remedial design and remedial action, proceeding directly to a section 106 referral; and proceeding directly to Fund-financed action.

CONCLUSION

In conclusion, I would like to reiterate that the Superfund program as enhanced by SARA is immense and extraordinarily complex. We are moving toward implementation on a broad range of fronts simultaneously, and we are proud of our accomplishments so far.

As with any program of this scope and complexity, experience and changing conditions will continue to call for new or altered approaches. We will work unremittingly to implement and improve the program you have entrusted to us, which is of critical importance to public health and the environment.

This concludes my prepared statement, Mr. Chairman. My colleagues and I will be happy to answer any questions you may have, either now or later in writing for the record.

Mr. Oberstar. Our next witnesses include the Office of Technology Assessment, represented by Dr. Joel S. Hirschhorn, Project Director for the Superfund Implementation Study; accompanied by Kirsten Oldenburg, OTA analyst.

Witnesses sworn.

TESTIMONY OF JOEL S. HIRSCHHORN, PROJECT DIRECTOR, SUPERFUND IMPLEMENTATION STUDY, OFFICE OF TECHNOLOGY ASSESSMENT, ACCOMPANIED BY KIRSTEN OLDENBURG, ANALYST, OFFICE OF TECHNOLOGY ASSESSMENT

Mr. Hirschhorn. Thank you, Mr. Chairman, for giving OTA the opportunity to participate in today's hearing.

Mr. Oberstar. On the contrary, we thank you and all of the support staff at OTA for the splendid work you have done in responding to the request of this committee, the full Committee on Public Works and Transportation, and the Energy and Commerce Committee for this detailed analysis, phase 1 of which we are going to be hearing today.

OTA has invested an enormous amount of time, energy, and creative effort into an analysis of the EPA stewardship of the Superfund program, including specifically the 1986 amendments. Your testimony, the delivered remarks, has focused on many, many specifics which we would like you to go into in detail because I think that it is important that we lay the specifics out, in addition to your general, overall observations about the operation of this program.

Mr. Hirschhorn. Well, thank you, sir.

Basically what we are trying to do is learn from experience and see exactly how the program is being implemented and whether or not the program is using consistent data and policies. Essentially what we are doing today is really information transfer.

I might note that almost all of the data and information that I will be referring to and which was used in our reports actually comes from EPA. Very little of it comes from outside of EPA.

We have tried to focus obviously on SARA, the amendments, and how they are being implemented. First, I would like to say that we are going to focus on technical issues and trying to find better solutions, trying to move beyond some of the traditional issues that have to do with who was to blame and who was paying how much. I think the paradox in Superfund is that so much is at stake that it's easy to lose sight of the basic environmental mission of the program: are we eliminating contamination from the soil and groundwater expeditiously, effectively, and permanently without transferring risks from one community to another? That's the basic question of Superfund.

I think our goal, like everyone else's is trying to improve the quality of the Superfund program, trying to come up with ideas to make it work better.

But I do point out at the very beginning that the problem Superfund is designed to solve is, in fact, growing faster than the delivery of solutions. Our analysis of EPA data shows that at the end of the second five-year reauthorization period, after probably more than $10 billion will have been spent, there will be considerably more contaminated sites to be cleaned than we had to begin with. This outcome is inevitable.

The total time for a site to move through the Superfund system to a final cleanup is often about 10 years. Every month, without letup, more sites requiring cleanup are identified even though the Government, I emphasize, has no site discovery program and is sending many sites into several other cleanup programs, as we, in fact, have just heard. Those cleanup programs outside the Superfund, I emphasize, do not face the same requirement that you have already talked about with regard to permanent remedies.

We estimated in 1985 that ultimately $300 billion might be spent by Superfund and the States and industry to clean up sites, and I would say at this time that estimate may prove low.

I would like to sum up our entire testimony and where we stand at this point in our continuing study by using plain language to say four simple things about the Superfund program as we see it.

First, public expectations are not being met by the current program.

Second, large amounts of money are being spent, and in too many cases little protection of public health and environment is being obtained.

Third, decisions about cleanups often lack a sound, technical basis but take a long time to make.

Fourth, the evidence shows that Superfund is not working. This challenges us to find out what is wrong and to fix it.

I really have three themes today that I would like to talk about. The first one is technology selection, and I'll be getting into some detail on that. After that, I will move on to talk about unintended consequence of SARA's mandated performance schedules. Lastly, I will deal with the issue of the workforce implementing cleanup in this country.

First, I'm going to be talking about technology selection. That means talking about records of decision. I would like to say just a few general words about what a record of decision really means to the public.

A record of decision is like a contract in a sense. It is a contract between the Government and the public. In that contract the Government, through EPA, is making a commitment to cleaning up a site. It's supposed to lay out a very specific plan to clean up that site.

The record of decision is really a very pivotal point in this whole complex Superfund process because the record of decision really has to integrate everything that has gone before that point. It somehow has to take into account all the other studies and all the other observations that may have gone on actually for a number of years.

Then the record of decision also has to look forward into the future, and it has to make a commitment about cleanup. So it really is an extremely critical point in the whole Superfund process.

The first major conclusion that we have is that better cleanup technologies are often not selected even though they are practical. What I am going to do first is give a description of what is going on now around the country in Superfund.

SARA provided very clear direction to use permanently effective waste treatment technologies instead of shipping waste to landfills and also instead of leaving waste in the ground. Nevertheless, the system still relies heavily on techniques that do not permanently destroy hazardous materials.

Let me first get into this discussion or continue it: what is permanent? I think there is a reasonable, common-sense understanding of what permanent means or should mean. A permanent cleanup is one that you don't have to do again and again and again. If one does a permanent cleanup at a site, then we would expect that no one, including the Government or any other party, has to revisit that site and somehow again try to fix it up and clean it up. That's what permanent means. I think that we can go into more detail, and I will as we go along.

Obviously, one way to achieve permanency of a problem that is associated with the hazardous material is, in fact, to destroy that hazardous material, to render something that is hazardous nonhazardous. You can do that in most cases by actually destroying the material. I mean changing molecules. If you have something like a solvent, an organic waste, it's possible through the use of technologies to convert it into harmless elements essentially. That is a good example of destroying something in a permanent way.

Our analysis of EPA's own data for fiscal year 1987 shows that they used destruction technology in 19 percent of the ROD's. Even then, I want to emphasize, that that data does not necessarily reveal the contribution of a destruction technology to the overall total cleanup at a site.

In contrast to that 19 percent for destruction technology, EPA chose land disposal and containment approaches—that is, leaving waste in the ground—in 42 percent of the cases. So it's 19 percent for destruction technology, over twice that for land disposal and containment.

Mr. Oberstar. Dr. Hirschhorn, I really don't like to interrupt a witness going through their opening remarks, but at that point, if I may, I would ask you to respond to the distinction spelled out by Mr. Thomas when I put that question to him. He said, well, that's not true of the final disposal of the site; that the number's substantially higher, the percentage of destruction or permanent removal is substantially higher than final treatment of the site whereas your numbers may be correct for the early stage. That was his reaction.

Mr. Hirschhorn. Yes. Well, I would say I see it a little differently. I would say that by the time they get to what they call the final step, they have already carted off a lot of the waste to a landfill. That's another way of looking at this.

It may be true that if you looked at the very last step, you might see more destruction technology, but I would raise the issue: what has gone on before that very last step? It's not unusual to see in what they call removal actions taking away large amounts of readily available hazardous waste; for example, drums of waste which are visible at the site or taking away contaminated soil from the site, and taking that, in fact, to a landfill. That is done within the removal program, and the removal program, which now has more money under SARA and more time, is outside the requirements of

SARA to use permanent technology for cleanup. I think this is very important.

As we all know, statistics can be made to show various things. But I really think the complete analysis of EPA's own data over many sites will reveal, does reveal, that, in fact, the use of destruction technology is a minority choice basically. It is not being chosen where it is practical, and clearly other activities are going on at these sites.

Again, we are victims ourselves of data that we get from EPA, and the very data that they have on technology selection that I know they are using is not on a site basis; it's on a ROD basis. It is true that there are, can be several ROD's for a particular site. Again, I would emphasize that most of those ROD's are not going to be using destruction technology even for one site.

Actually, that was my next point that I really wanted to make—was, in fact, that removal actions today can spend several million dollars a shot—and that's a new situation. SARA provides more money and more time for EPA to carry out what they call removal actions. Those actions are outside the requirements to use treatment cleanup technologies.

Again, those actions can be simply taking the waste to a landfill. That is exactly not the intent of removal actions. I mean, the intent of removal actions is to prevent the site from getting worse and to protect public health and the environment. The purpose of removal actions is not to circumvent the 121 provision of SARA which has to do with the use of permanent treatments as remedies.

I would raise the issue of concern about the use of removal actions which are outside the other part of SARA that deals with remedial cleanups and directs EPA to use permanent technologies. I would also raise the issue—and I'll give you an example—of how these removal actions simply can sort of make things worse in the future.

Crystal City is a Superfund site in Texas. I was there last week, in fact. There were removal actions at Crystal City. What did those removal actions consist of? They consisted of digging up hazardous materials and burying them in several places on the site, which turns out to be a municipal airport.

Now they have come back to Crystal City. In fact, they issued a record of decision this past September. What is the remedial cleanup chosen for Crystal City? It is to dig up exactly those hazardous wastes which they buried in previous removal actions and bring them all together—they call this consolidation—and bury the originally-buried hazardous waste once again in a new hole in the ground, without a liner I might add, and bury it on this site and cap it, which again, without land use restrictions, can still be used as a municipal airport which the local officials want for economic development.

We have in the case of Crystal City, I think, a really good illustration not only of choosing land disposal for the remedial cleanup, but seeing the high cost of digging up the waste which was buried earlier in a removal action. Again, this idea—the removal action to begin with obviously wasn't permanent. It wasn't a permanent remedy because here we are going back again at Crystal City to work at it again, and even the second time around it's burial again.

I might note that I recently found a sister site to Crystal City this past week, in fact, which I find very interesting. Crystal City's origin was that it was a crop dusting kind of situation. Planes were spraying crops. It's an agricultural area. That's the origin of the Superfund site. It's a pesticide-contaminated site.

As you might imagine, there are lots of other sites around the country where there was crop dusting. I've begun to look this week and found another site identical in its history to Crystal City. It's interesting that at this other site they selected incineration of the pesticide waste. I think obviously not all of the conditions are the same at this site, but it's interesting that at Crystal City EPA raised the technical reason for not using incineration. They said they had an awful problem because of arsenic and you couldn't destroy arsenic, and they're right; you can't destroy metals in an incinerator. Metals will come through the system; you'll still have arsenic at the end.

Interestingly enough, at this other site, however, where they did choose incineration, the problem of arsenic was never even raised. Again, I'm illustrating technical inconsistency. When they found it convenient at Crystal City, they came up with a technical reason not to use incineration. At some other site, different circumstances, different community, different State, different EPA region, they didn't raise that technical problem at all when, in fact, they chose incineration.

A point here is that our case studies show that often environmental problems are ignored or discounted in order to justify land disposal, and there's still definitely a lot of land disposal going on.

Another example I have in the testimony is the Compass Industries site in Oklahoma. Let me quote from the record of decision. It says that, "The remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable."

The selected remedy is leaving the hazardous waste in the ground and capping the site. That is what EPA chose and that is what they call in the record of decision utilizing a permanent solution.

There is no commitment in that site, by the way, to treat contaminated groundwater which is flowing into the nearby Arkansas River. This is a site on a cliff right over a major river. The contaminated groundwater is essentially coming out the cliff and going right into the river.

It is a tough site. It is a large Superfund site, but it's pretty clear that the record of decision does not, in fact, use a permanent remedy. It is what we call containment.

I will read another statement from that record of decision. Again, it gives the impression at one point that they selected a permanent remedy.

"The potential for future fires and continued offsite migration of contaminants pose adverse human health and environmental impacts. Other impacts which the site may pose cannot be effectively predicted."

Now that's from the record of decision. Is that statement consistent with the other perspective I quoted where they seemed to give the impression that they picked a permanent remedy.

Well, if you can't predict the future because you've left the waste in the ground, I think most ordinary people are going to have a hard time seeing the selected remedy as permanent.

I would like to just compare that—that's for the Compass Industries site in Oklahoma where they select containment and then try to call it permanent and then try to justify it.

I would like to read a statement from another Superfund site record of decision. One of the things we are doing in trying to understand the system is looking at different sites around the country and trying to show how inconsistent this program is.

I would like to read a statement from a site called the Pristine Site in Ohio. It had to do with their justification for selecting a remedy.

"Because there is no treatment of soils to reduce the mobility, toxicity, or volume, it is not a permanent remedy, and it is the least preferred under SARA."

That was a quote in the context trying to justify in the case of Pristine why they did not choose land disposal or containment. It just seems that you can't have it both ways.

Here we have EPA in this record of decision saying very clearly that if there is no treatment of contaminated soil, no reduction of mobility, toxicity, or volume, it's not permanent, it doesn't meet the law, and yet that same kind of remedy which the Pristine Site declined, rejected has been selected at many other sites. There is a fundamental inconsistency in the decisionmaking process which relates to the selection of technology. What's good over here is bad over there; what's bad over there is good somewhere else.

I would like to illustrate another—and this is a new problem in Superfund, in a sense created because of the public and congressional interest in using better technologies. The new problem is this: not all treatment technologies offer the same level of protection or effectiveness.

It's very important for nontechnical people to understand that not every technology which is called treatment offers the same degree of environmental protection, nor does every treatment technology satisfy the letter and spirit of the law.

I know this can get complicated, but I would like to give a few examples because I think it is very important. One example is a group of technologies which we call separation technologies. I think ordinary people can understand what these technologies are all about.

There are many technologies that you can take to a cleanup site which essentially separate out the hazardous material from the nonhazardous material. That's what we mean by separation technology.

Now the real issue is: what do you do with the hazardous material that you separate out? Again, the problem here is that it's very easy to separate out hazardous material and do one of two things with it—put it right back into the atmosphere, let it go into the air, or collect it in a concentrated form and, again, send it to a landfill.

Now there is a third option, and that would be to destroy with, again, something like incineration technology, the very material that you separated and concentrated. But, again, I point out that that's not necessarily done.

But what you see, then, is you can accumulate your statistics, as EPA does, and say you've used treatment technology at a site; it's been separation treatment technology; it hasn't itself destroyed anything. In fact, if you look at Superfund sites, you will see things called air strippers being used. If you have contaminated groundwater, they pass it through air stripper or steam strippers.

What do they do? They take volatile, organic, hazardous material and separate it out. It comes out from the water and in most cases it goes into the atmosphere, directly back into the air. In some cases where it's not collected on carbon, absorbed on carbon, and then that contaminated material is sent to a landfill.

Another example of treatment technology which is not destruction technology is what we call chemical stabilization or what other people might call fixation or solidification, a popular approach, a very trendy technology, if you will, in Superfund.

What this kind of technology does basically is disperse and embed and essentially dilute that which is hazardous in a lot of inert material—large amounts of cement, for example, that kind of material can be mixed with something that's hazardous and it solidifies, and now you have a large block or little pieces of hard, stabilized or solidified material.

The issue is: well, what has that done? Has that destroyed the hazardous material? Is that a permanent remedy? I say to you not likely.

All we've done is used the dilution is a solution kind of approach except we've used dilution—instead of the air or the water, we've used it in a solid form.

But this is what we see being chosen all over the country. Several sites I mentioned in the testimony where stabilization has been chosen for extremely complex contaminated sites, sites where there is a lot of organic contamination.

Tacoma Tar Pit Site in Washington, Sand Springs Site in Oklahoma, Chemical Control Site in New Jersey, the Liquid Disposal Site in Michigan are all examples, in a sense, of the inappropriate use of stabilization technology. It does offer destruction of the hazardous material. It does offer a permanent remedy.

In fact, stabilization, as I give an example in the testimony, was used in 1985 at a major Superfund site. One of the interesting things about the Superfund system is you never hear people talk about the failures of technology too much, and that's part of information transfer, too. One should hear about things that work and one should hear about things that don't work.

At Conservation Chemical Site in Missouri chemical stabilization failed. We're now at that same site on the third remedial cleanup selection. Two things have already failed at that site.

What's interesting, of course, is that they used chemical stabilization. They have massive amounts now, even larger volumes, of material which contains the hazardous stuff that was in the site to begin with. Now all it does is create even a worse problem to try to clean up that site because you have something already sitting there that is ineffective, and it just technically makes the ultimate cleanup more difficult. Again, we're on a third version of cleanup for that site.

There are a lot of reasons why EPA is not selecting more effective technologies, and I would like to go into some of those reasons. First, there is ambiguity in the statute itself which I think has opened the door to some very interesting interpretations.

SARA talks about reducing "the toxicity, mobility, or volume" of hazardous material. I think the word "or" is very important. One should see that phrase and read it very carefully: "toxicity, mobility, or volume."

I find it interesting, by the way, that sometimes, including I think Mr. Thomas' testimony today, the word "or" has been replaced with the word "and," as if all three have to be done.

Well, it's interesting that the statute didn't really—and I'm not a lawyer, but probably lawyers would argue that it doesn't absolutely require that toxicity, mobility, and volume all be reduced. In fact, I do want to emphasize that EPA has never taken a position on the preference for reducing toxicity over the preference for reducing mobility or volume, and, technically speaking, it's quite different.

If we reduce toxicity, we're again talking about destruction technology; we're talking about a permanent remedy. To reduce mobility, what does that mean? It might be better than doing nothing. For example, putting a wall around a contaminated site or covering it with clay—well, that can reduce mobility for some period of time, but it's not the same thing as destroying the hazardous material, reducing its toxicity.

Reducing volume—well, that's separation technology again. You can use separation technology and reduce volume and all you've done is actually wound up with a more concentrated mass of hazardous or toxic material.

It's important to see this choice and to see that there is an underlying reason and an ambiguity created by lack of firm guidance. There is confusion over what a permanent remedy means. It goes back to the interpretation of those words in the statute.

I might note that, if EPA wanted to, it could have come up with an explicit definition of what a permanent remedy means, and it could have related that to the preference for reduction in toxicity over the preference for reducing mobility in volume.

Clearly, the records of decision that we have been looking at exhibit a great deal of confusion over the issue of permanency. I would like, again, to give you a concrete example of what I am talking about.

There is a record of decision for a site called the Liquid Disposal Site. At one point in the record of decision, and I quote, the ROD reads, "Remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable."

A few pages later, however, this is what the same rod a few pages later says: "The selected remedy is not considered permanent because hazardous substances will remain at the site."

By the way, a few pages later the same record of decision then goes back and essentially says that the remedy is once again permanent.

Here we have in one document different views of a nontrivial issue at this site. Is the selected remedy permanent or is it not permanent? Well, EPA in the same document has said exactly the opposite things.

There are also other reasons why more effective technologies are not being chosen, and I would like to just run over a few of them.

There is another interesting provision in SARA which very few people talk about. There is a statutory requirement for EPA to analyze the long-term risks and costs of choosing a land disposal or containment option. That's looking at sort of the flip side of the possibility.

Clearly, that requirement in the statute is not being generally complied with. We've looked at a lot of records of decision, particularly ones where they choose containment and land disposal. Virtually in every case there has been no serious attempt to analyze how that remedy may fail in the future, which gets to the heart of the matter: is the remedy which is land disposal and containment permanent or not?

If you do the analysis and you talk about all the ways it may fail in the future and what that will mean for future cleanup, you tear down your own case to argue that land disposal option is permanent.

One of the examples that we mention here is the Schmalz Site in Wisconsin. The remedy selected was putting a simple earth cover, not even a multi-layered cap which people talk about for hazardous waste landfills, but this is a simple earth cover over the contaminated site. By the way, that's a real cheap remedy. That's only $800,000.

That's a trend, by the way, you'll normally see. When the remedy chooses containment and land disposal, generally you will see it reflected in relatively low cost.

The point is the Schmalz Site again there was no careful analysis of whether or not capping the site, covering it up with earth, really was going to last for years or decades even, because the hazardous materials are going to stay hazardous for very long periods of time. As I note, there was no real analysis of failure of the cap even though we have identified another Superfund site, the Winthrop Landfill in Maine, where in fact they also selected putting in a cap and, before they even finished constructing the cap, it had already failed.

Again, a lack of information transfer throughout the system of when remedies fail and now they're selecting the same technology with similar kinds of problems at other sites.

I have also pointed out in the testimony that another reason they don't pick better technologies is because there are very inaccurate cost estimates made for alternative cleanup approaches. That's what a record of decision is supposed to do. It's supposed to look at different alternatives. It's supposed to estimate the cost, among other things, obviously primarily give attention to whether there is environmental protection being offered by those alternatives.

But my first point is that they are not calculating the cost correctly. One of the examples we give is again the Pristine Site in Ohio. That's a very interesting record of decision because, if you read it, EPA is saying that the only basis ultimately for choosing between two alternatives—it came down to two treatment alternatives—and they say the only reason for choosing one over the other was because one was a lot more expensive than the other.

Well, we looked at the cost that they calculated for the expensive one. It just didn't look right, quite honestly, when you first looked at the situation. They calculated that onsite incineration would cost $50 million. Well, we went back and recalculated the cost, and we calculate something about $25 million. Twenty-five million is exactly what the other remedy was estimated to cost, the one they chose.

But, interestingly enough, the one they chose was an unproven technology. The one they rejected on the basis of a cost estimate twice as high as it should be is, in fact, a proven technology.

It's clear that the estimate was wrong. Again, the way we do this is we go to other EPA data. It's easy to find other Superfund sites where EPA is using the correct data. So some contractors and some regional offices are using correct data. In the case of this estimate, Pristine, the people had used unit costs for incineration which were two to three times the correct value—just wrong data. It's wrong on the basis not of what we're coming up with independently; it's wrong on the basis of what EPA says elsewhere within the system is, in fact, the correct data.

Another reason why we have a problem with selecting better technologies is simply the fact that we have many more technologies entering the market. There really is a problem here and that is the more technologies that people develop and want used, the more difficult it seems to be for EPA in the remedial investigation feasibility study to analyze more and more technologies.

I emphasize that this situation is a particular burden for a largely inexperienced cleanup workforce. How can people analyze more and more complicated technologies as the program is constantly growing?

I do want to just emphasize a positive note here. There are many more cleanup technologies which have entered the marketplace. There is no absence of cleanup technologies. More and more people have developed more and more different kinds of cleanup technologies. I think people ought to look at that in a very optimistic way.

But on the down side, it seems to create a problem for the analytical processes used by EPA in Superfund to choose out of this increasing array of technologies one or two that really are the best ones for that particular situation.

What we say really is that there is a great need to finetune the study process that people have complained about a great deal. One way to do this that we suggest here is to eliminate more alternatives very early in the study process. That study process, by the way, can go on for a number of years.

Well, rather than study 10 or 20 or 30 technologies, it's possible for people to say at the very beginning of the process, using technical expertise, and indeed maybe taking some risk to narrow the field down and say, listen, it really looks like there are only two or three or four that really could work at this site. If they did that, we could cut the cost and the time for the study process.

But I emphasize that doing that takes experience; it takes a lot of technical expertise. That is a problem in the current program.

Another point I would like to make in terms of what is going on in the system is that, if one reads records of decision, you frequently see that there is, in fact, no technical case made for whatever was selected. I emphasize that because we have never said, as EPA sort of intimated, that at every site one would want to use, for example, incineration. The law, in fact, does not require destruction technology to be used at every site. That would take away all flexibility. It would be blind to the realities of complex Superfund sites.

There are Superfund sites where land disposal and containment probably are, in fact, the best answers. The point that I am trying to make is that the record of decision is supposed to make a sound technical case for choosing either the treatment remedy or, in fact, the nontreatment remedy. What I am saying now is that if you read these records of decision, you do not see careful analysis, data, and logic.

In fact, I would like to give probably the most egregious example of what is going on across the country in Superfund ROD's, and that is literally putting the cart before the horse. If you read records of decision, you will see time and time again that for the technology selected EPA is committed to doing a treatability test or study after the record of decision. Now this may sound strange, but here they have done a study. They may have spent $500,000 or a million dollars on an RIFS, spent several years doing those site studies, and then they reach the record of decision stage. They select a technology, but they haven't tested the technology for that site material.

You don't have any data to substantiate the position that that technology works at that site. They've gone ahead and selected the technology and said, well, they're going to run the tests later after the ROD to see whether or not the technology that they have already selected will work at the site.

This seems illogical. It is not representative of good engineering practice. I don't think the public can readily accept the fact that one is going to be testing after the ROD to try to make the case for the ROD decision. I emphasize that what happens after the record of decision is a largely invisible process. The opportunity for public comment exists before the record of decision. The public is most involved in the remedial investigation feasibility study stages and they have a chance to comment on the studies before the record of decision is issued.

Putting that testing after the record of decision I think raises legitimate concerns about what that testing will be, how visible the test data will be, who will make the decision whether or not the test data really affirms the record of decision selection or whether the test data does not do that.

What I am saying is that records of decision as they now stand really are not much more than assertion. They assert that the remedy is permanent. The Government says the remedy is permanent, but where is the data? Where is the analysis to back that up?

For the largest part, you don't see carefully documented decision documents. I'm not saying that's true in every case. I want to emphasize that.

In our interim report which we hope comes out in June for you we will give some positive case studies. We will give study sites where, in fact, they have done the right thing. They have done the process in the right way. One can find sites where they have done the testing before the decision, not after it.

Another point I would like to make is that—and we have heard some reference to it already from EPA—that there is this SITE technology demonstration program. It did come about because of SARA. It is interesting to note here that we have looked at several Superfund sites where, in fact, they have selected the very same technology which is in the technology demonstration program. This has happened at Chemical Control in New Jersey, Sand Springs in Oklahoma, Pristine in Ohio.

I would like again to quote from an EPA document which is the justification, the rationale, for the SITE technology demonstration program. It says:

"To obtain sound engineering and cost data, to resolve issues standing in the way of actual full-scale application"—that's the reason for testing the technology in the site program.

Then how can you justify to the public selecting those very same technologies for full-scale application before the test results have come in from the SITE program? What I am saying is it's hard to have it both ways. Either the technologies need to be demonstrated and belong in the SITE program or they don't. Right now we see a number of cases where it just doesn't make sense. Essentially, what I am saying is that we have records of decision for real, full- scale applications which are essentially experiments. That's the only way I could look at it, but they are not labeled as experiments which regard to what the public sees.

Another point is that the role of responsible parties in selecting cleanup technology I think is very interesting. We have looked at a few cases which, in fact, one sees a sort of double-standard operating. There have been several Superfund sites where responsible parties essentially said to the Government, "We don't like the remedy you selected and we think we have a better remedy."

Interestingly enough, in several of those cases the responsible party did the expensive testing that the Government itself does not do. So you really have responsible parties trying to get what they think is a good remedy selected, doing a lot of expensive treatability testing on real site materials at their own expense in order to overturn a Government decision without test data. Now that to me is a double standard. That is, the private parties have to do the testing which the Government itself is not doing.

But I do want to emphasize that the responsible parties are being effective in getting remedies selected that they want. I think one ought to understand that the remedies they want are almost always cheaper remedies. I mean, if one is paying the bill, there is a built-in incentive to keep the costs low.

I raise a concern there that again we ought to ask the question: are the remedies which the responsible parties want consistent with the statute? Are they permanent remedies? Do they destroy hazardous material? I would emphasize that in most cases that's not the case at all. In most cases we see responsible parties trying to get the Government not to use a more expensive destruction technology in order to use something else which is a lower cost. It may be labeled treatment, but it may not be a destruction technology.

I also would point out, because I had this direct experience last week in Crystal City, that the responsible parties are in an interesting position to get remedies selected that they want for the reasons that they want, but in communities like Crystal City around the country where everyone opposed the remedies selected by the Government, the Government did not change their position. That is, the Government is very responsive to responsible parties whom they want to pay for the cleanup.

If one looks around the country, you don't see people that often opposing a permanent remedy. You see people, as at Crystal City, wanting a permanent remedy and in those cases not getting what they want because they are not a deep pocket.

If EPA doesn't have a responsible party who wants to select a lower-cost remedy, it itself has some motivation to pick a low-cost remedy because it wants to spread the money around, as I think we've heard, at as many sites as possible. Again, the question becomes: what does the remedy do? What is the level of environmental protection that we get from the remedies that are actually chosen?

I can't emphasize enough the need to deal with environmental performance, the need to go beyond the sort of superficial level of using phrases like cost effectiveness. Let me be concrete again with you.

It's easy to talk about picking a cost-effective remedy when what you've done is compared stabilization where we mix waste with cement versus incineration where we destroy hazardous materials. I would make the technical point that stabilization does not give the same level of environmental protection as destroying the waste. There are other ways to destroy the waste. Biological treatment is an alternative to thermal treatment, and there are some forms of chemical destruction of waste.

But the issue I'm raising is a generic issue: would you argue that something that destroys hazardous material permanently and irreversibly is comparable to something that does not destroy the hazardous material. What I am saying is if you read and analyze records of decision, what you see is the logic of EPA's case is that they maintain that the low- cost alternative which is not destroying the hazardous material is comparable and therefore cost effective in comparison to a higher-cost remedy that does destroy the hazardous material. If it's not comparable environmental protection, then it's not even possible to talk about cost effectiveness if you pluck out a low-cost remedy that gives you lower protection, and I mean lower protection that doesn't give a satisfactory cleanup.

Well, this is all I'm going to say at this point, I guess, on technology selection. I tried not to get too technical, but I do want to give a clear impression that we have real problems here in interpreting the statutory mandate for a permanent remedy; that the situation in reality around the country, although it is better undoubtedly—I'll be the first one to say that today we're probably using more of the destruction technologies than we used a few years ago, but that's not the issue. There is always some incremental progress.

I think the larger issue is that we are going to have hundreds, if not thousands, of sites around the country where we will not have the best technologies chosen for cleanup.

I'd like to move on to that second theme that I mentioned earlier about statutory mandates. SARA imposes on EPA, as you know, a number of schedules for performance, and the point that we make here in looking at how EPA is trying to comply with those schedules is that what we see are essentially bureaucratic ways to meet bean counting goals rather than dealing with the substance, the environmental mission of the program.

We have a few examples in the testimony. We've heard mention of preliminary assessment and site inspections. Those are required, and there is a certain schedule for them.

One of the interesting things about—the very first step in Superfund is, in fact, the preliminary assessment. It's where you first look at a site and you make a very critical judgment: do you keep the site in or do you throw it out of the system? Historically EPA's data shows that they were eliminating about 20 percent of the sites at the very first stage of the process. Now they have to meet schedules. They have to do more preliminary assessments.

How do they meet Congress' goal? They decide bureaucratically that they will eliminate 40 percent or more of the sites at that same first step. Well, if you throw out more sites at the beginning, then you help meet the schedules that pertain to later actions and decisions.

The question that we raise here is: is the Government eliminating sites unnecessarily? Are sites being thrown out of the Superfund system that really do require a cleanup, that may have, in fact, stayed in the system previously but now, because of the performance schedules, are being eliminated from the system—false negatives?

In the health care field people worry a whole lot about false negatives, saying something is not a problem when it really is a problem. I would note that in the State of Minnesota, that we happened to have some data on that nearly 50 percent of the sites that the State of Minnesota says ought to be cleaned up in their own State would pass right through the Superfund screens. They would not make it in the Federal system.

Now, in a sense, the State of Minnesota has a safety net; that is, it has a strong State Superfund program to catch all those sites that would not qualify in the Federal system. But, interestingly enough, very few States around the country have such aggressive, strong programs where they would catch all those sites that will pass through the Federal system.

So we have a potential around the country of very large numbers of sites being eliminated very early in the Superfund process, even though they really require cleanup. There are other examples that we give, and one of the points I would make is there should be no illusions about how fast the Superfund process is working these days. We heard some statistics about how many preliminary assessments had been done recently. Let me give you another kind of statistic.

A question to ask is: how long are those sites sitting there before the preliminary assessment is done? As an example, we looked at data from New York State put into the Superfund system in December 1987. Interestingly enough, out of all the sites that had gotten a preliminary assessment, 80 percent had waited six or seven years—six or seven years—sitting there without getting the first initial preliminary assessment. So the system is working very slowly at the very beginning of the process, working very slowly even after that, years later when you get to do the remedial investigation feasibility study and finally get to a record of decision. What we are seeing is a very long period of time they can wait, and obviously sites can get worse over time.

Another example of dealing with time schedules has to do with completing the remedial investigation feasibility studies. EPA repeatedly in the last few months has spoken a great deal about doing the study, the RIFS, in 18 months. We could find no analysis or information to support the feasibility of an 18-month RIFS.

I will tell you what the RIFS's are taking now in terms of time. They are taking about three years. We just raise the issue here: what is the implication of trying to meet the congressionally-mandated schedule to turn out more studies by telling the contractors do them in less time, do them in 18 months; we'll pump out more studies?

One consequence is telling the contractors also, therefore, not to do those treatability studies I talked about doing, not to do them before the record of decision, but to do them after the record of decision because the bean counting is coming at the record of decision, and you want to complete the studies and turn out the ROD's. So you postpone the treatability studies which should be done in that process until late in the process. So you make the statistics look good. You try to comply with the schedules, and, in fact, you make decisions that are indefensible in terms of technical data.

I might also note that those schedules are doing some perverse things. We found the site—it happens to be the Liquid Disposal Site in Michigan—where EPA refused to give the community more time to extend the public comment period, which I find very interesting if you ask people in communities around the country—again, I was at Crystal City last week and the mayor and his other colleagues were asked, "Could you possibly understand and read these feasibility studies?" He said no.

They are having a tough time dealing with the technical content and they often ask for more time. In this case, EPA refused to give them more time and invoked the congressional schedule. If we give you more time, we won't complete the record of decision at the end of the fiscal year; we won't get credit for the record of decision at the end of the fiscal year; therefore, the public cannot have more time to review the documents and intelligently deal with the decision.

There are these unintended consequences of these mandated schedules. The more you get into this, the more concerned you might be.

The last theme that we've already heard somewhat about today is the workforce. I can't emphasize enough in trying to understand why we see the things we see we have come to understand that there is a major problem in Superfund, and that is a workforce problem, a human resource issue. Clearly, Superfund has grown explosively. I would say that the single biggest cross-cutting issue is a largely inexperienced, untrained workforce which is also characterized by very high turnover rates.

I want to emphasize I'm not just talking about the people in the Government; I'm talking a much larger number of people who work in the contracting community, in the engineering consulting industry. They do most of the work for Superfund. They probably do way over 90 percent of all the activity whatsoever related to Superfund. It's that workforce that I'm talking about, too.

They are untrained. They are inexperienced. They, themselves, are changing jobs constantly from one engineering firm to another.

We have seen this as a major problem because we see reports—and I've tried to give you some examples—which lack technical accuracy and which lack comprehensiveness, which lack internal logic and consistency. After a while there can be only one explanation of why one sees all these problems in Superfund, and the answer is the people.

I'm not saying they don't want to do good work, but I am saying that they may not have the capabilities to do high-quality work. I'm also saying something else, and that is it's hard to look at the Superfund program and find effective incentives for quality work. The incentives in Superfund are to turn out reports, to turn out statistics. There are few, if any, incentives, built in the system to do quality work.

If you look at EPA and if you look at the people running these multimillion dollar cleanup projects, you will find young college graduates, people just out of school literally who are put in charge of multimillion dollar, major engineering projects, great technical complexity. They are simply ill equipped to deal with that kind of responsibility.

I guess the last point I want to make on the workforce problem is the reason you have a workforce problem obviously is also due to the fact that there are insufficient management controls in the system to make sure that the inexperienced workforce doesn't sort of get all the way to the end of the system and produce things of poor quality. I mean, the more inexperienced the workforce, the more the need for a lot of supervision, a lot of quality control, a lot of technical peer review, a lot of central management controls in a very decentralized system.

It just isn't there basically. The management controls are not there to compensate for the inexperience of the workforce.

I will end on an optimistic note. This is not the time to do it; we're not quite prepared. But I think that at the end of the study, which we hope to complete by the end of the year, we will be dealing with ways to fix Superfund, and clearly a very high priority area is to deal directly with the limitations of the workforce.

This situation is not going to change, I want to emphasize. The nature of this market, the nature of the cleanup situation in the country is such that we can't get ahead of the curve very easily.

Just as an example, if somebody gets some technical experience in this industry, they are very likely to become a marketing person or a manager. What I am saying is that people in the trenches doing the technical work are going to have very few people to learn from, very few experienced people to learn from. That's not going to change.

But there are technical ways that we will explore in the total study for you on how to overcome the limits of the workforce. For example, we could get into information transfer, central databases, expert systems, and things like that to help improve the output of the workforce even though they may be relatively young and inexperienced.

Thank you.

Mr. **Oberstar**. Thank you very, very much, Dr. Hirschhorn, for a rapid-fire review and distillation of many months, long, long hours of time thrust into view, as requested by the requesting committees. You have shared with us the highlights of your intensive review of this program and phase 1.

What we are dealing with here, what you have presented to the committee, is your analysis and critique of where Superfund is. The next phase, and that which we also await, is what to do about problems uncovered. You have not failed to point out that that is an objective of this study—not to scrap Superfund or be critical of people, but to find out what is not working, why, and how to fix it, in your judgment.

Now let's go to costs, costs of various technologies. First of all, going back to something that I asked Mr. Thomas, have you and your staff been consulting with EPA personnel, sharing with them some of your thoughts?

Mr. **Hirschhorn**. We have had a number of meetings with EPA. I would be less than honest if I said that there haven't been problems. We have had to work very hard to get the information that we need to do the study from EPA.

I think the one thing we learned—as I say, most of our data and information does originate in EPA. The problem is it's a very decentralized system. Sometimes we're asking for information from all these different pieces of EPA that headquarters itself does not assemble.

I often say that there are really 11 EPA's. There are 10 regions and headquarters. The regions really do the major part of implementing Superfund.

We have had problems, I would say, in getting information from EPA, but we have had many discussions. Ms. Oldenburg is, in fact, embarking soon on a trip to visit regions around the country to deal again in a detailed way with EPA staff people.

Mr. **Oberstar**. Well, that is a problem that we have dealt with for several years with EPA, of the headquarters and the 10 regional offices and the need to standardize procedures and have uniformity while yet responding to unique local situations.

Do you have a sense that there is sufficient program guidance from headquarters to regions?

Mr. **Hirschhorn**. I think if you read the guidelines very carefully, you will see that the guidance is worded in such a way as to provide maximum flexibility to the regions. That is, headquarters is not necessarily demanding, requiring a certain kind of consistent process or behavior among the regions. It may state a preference. Then it may leave the door wide open for the regions to do whatever they want to do.

I would say most of the data that we have, which is data on a regional basis, shows enormous inconsistency among the EPA regions.

Mr. **Oberstar**. That inconsistency is a matter of some concern to this committee because we find that in FAA, we find that in the bridge inspection program, we find that in the urban mass transit administration—the different regions of the country interpret the same guidance in different ways.

In FAA it is a matter of great concern to us because it results in different safety levels in different parts of the country. We have a great concern about maintaining flexibility and thereby response to meet local situations, but also maintaining a central direction and central thrust which assures that the law is being carried out in all parts of the country as intended.

What you've said about the workforce ties in with critique of records of decision. Internal inconsistencies—you've cited these in your prepared testimony. In one place there is reference to a permanent solution—selected remedy as a permanent solution; later on it says but the toxic substance will remain in place. Now that's patently inconsistent just on the face of it.

But is such a record of decision statement a product of inexperienced workforce trying to do a great deal in a tight time constraint or is it a product of just inattentiveness?

Mr. **Hirschhorn**. I think it is interesting to note that it's not completely explained by rushing through the process because that process has taken a lot of years. I mean, we're talking about records of decision which come about after the RIFS. We're talking about a several-year period.

It's not as if the explanation is merely rushing through all these studies. I think an obvious explanation as we often ask ourselves: is anyone reading these? I mean, literally, is anyone reading the documents in toto——

Mr. **Oberstar**. In that case, then, is such a document a product also of a point you raised in your last remarks, lack of adequate supervision, lack of sufficient management control?

Someone is writing these decisions. Perhaps, as you say, they are people just fresh out of college, fired up, and entering into this project without a great deal of experience. Fine, but then someone at another level has to review that document, read through it and make sure that it is internally consistent, that it does carry out the law and achieve the objectives. If you find these inconsistencies, they've got to be dealt with.

Mr. **Hirschhorn**. Yes. There is an enormous level of inconsistency. You can—we have, in fact, looked at the background feasibility studies and you see different data in the studies than you see used in the record of decision. That is exactly my point—that is, the evidence is that there is a lack of supervision, a lack of management control.

Now sometimes you can explain this by the end-of-the-year rushing of ROD's that was referred to earlier in the hearing. I think we were the ones who uncovered that first. An enormous fraction of ROD's are done in the last day or two of September, the end of the fiscal year.

The rushing of the ROD could explain some of the sloppiness that one sees, but I emphasize that it goes deeper than that. There is a fundamental problem here in terms of lack of good information, lack of logic, lack of analysis, lack of consistency. It's not just within the ROD itself; it has to do with all those expensive studies—again, remember, we're spending hundreds of thousands of dollars, millions of dollars sometimes, on studies which are supposed to be the basis of the ROD.

Mr. Oberstar. Yes, but my concern is whether the persons, the technicians writing the ROD's really understand the mission, understand the distinction between permanent cleanup and one that leaves toxic substance in place or do they not understand that distinction?

To have written something as you have described in your prepared testimony and to leave that in place could mean the person just slipped up, just wrote something part 1 and later on in the latter portion of the report was just inattentive, did not recognize that he or she was writing something inconsistent. It would disturb me much more if that person did not know the difference between permanent cleanup and one that leaves toxic substances in place.

Mr. Hirschhorn. I think they don't know the difference. I think the situation has been created that there is simply too much ambiguity throughout the Superfund program. People in different regions can have their own interpretations of what permanent means. People with different contractors who do the work will have different interpretations. Different individuals within the same office will have different interpretations.

That's why we try to quote from documents from different regions and different offices—to illustrate this enormous lack of consistency. One way to deal with that would be, in fact, with strong guidance from headquarters. This is not an intractable problem. There ought to be one view of permanence, and I can come up with Records of Decision which have wonderful views, I think, technically accurate views of permanence, views which are absolutely consistent with congressional intent, but they are isolated cases.

Mr. Oberstar. Let's go to costs, which is a major point, costs of technology selection. I remember during the markup stage of this legislation the EPA being, out of their own conviction or as directed by OMB or the White House—I don't know who—saying $8.5 billion or $10 billion, which was the House number, was way too much; we don't need that amount, to use that amount. Now they're coming back and saying, well, these cleanups of the kind that the Congress envisioned, the destruction technology is going to cost too much. I will be asking EPA to comment on that further.

Do they have cost estimates, reliable cost estimates for various cleanup technologies, and are you aware of such cost estimates? Are they substantiated by either experience or second opinions?

Mr. Hirschhorn. Oh, yes, we have looked into that. We have gone to the manufacturers of technology, the people who actually do the work, to check on what their prices actually are and then compared them to the data that EPA or its contractors are using. Again, in some cases they are using reasonable data and in other cases the data is just inaccurate.

I do want to emphasize that in general doing a permanent, effective cleanup is probably going to cost more money than impermanent cleanup. I don't think anyone ought to shy away from that reality.

People choose impermanent remedies not because they want impermanence; they choose them primarily in the Superfund system because they offer lower costs. That's what one sees.

On the other hand, I would like to give a positive point here, and that is the cost of some of the best technology has come down and is likely to come down. There is enormous progress in biological treatment as an alternative to incineration. Biological treatment in some cases may be a lot cheaper than incineration. In actual fact, the cost of incineration itself in the last couple of years has come down by a very large amount, probably because of more competition and not just changing technology.

Mr. OBERSTAR. Are there different costs for different types of incineration—not different types, but incineration of different types of materials? Is there a cost schedule established? Do you have that information?

Mr. HIRSCHHORN. A firm that does the incineration, who bids on a job, is going to demand more money for certain more difficult materials. Take dioxin, for example. The burning of the dioxin-contaminated soil at Love Canal which EPA mentioned is probably going to be more on the expensive side because there are regulatory requirements for dioxin which are more stringent than for burning other kinds of materials, and people are just more nervous about dioxin. That's going to be more costly.

Sometimes you're dealing with materials at Superfund sites which are very difficult to handle—thick, gummy sludges, for example. That could be a lot more difficult to deal with than simple contaminated earth.

There are ranges of costs that depend not only on the type of material, but also on the quantity of material at Superfund sites. We do have an economy of scale, and I would point out it's kind of interesting, if you look at records of decision on why incineration is often rejected, it's because there's too much material to be burned and also because there's too little material to be burned. One sees that explanation routinely.

Interestingly enough, the more material that you have to burn, the lower the unit cost. I do admit at the low end, if you have a very small amount of material to be burned, you can have a very high cost because it takes a lot of money to bring the equipment in and you're not going to be there for a long time, so you have a high fixed cost.

Mr. OBERSTAR. Now we cannot be blind to costs. We do have to—we have budget deficits that we're dealing with. I'm particularly sensitive to that, sitting on the Budget Committee. We do have to recognize there are some limitations, but how do you assign cost-effectiveness criteria to various issues in problem areas?

Mr. HIRSCHHORN. That was one of the important parts of SARA that I briefly alluded to. The requirement in SARA to examine the long-term risks and costs of using an impermanent remedy, something like land disposal or containment, that's very important, because if you don't do that, what happens is you focus on the short-term costs. You focus on the lower cost of an impermanent remedy like leaving it in the ground and putting a cap over it, and then you compare that to something like incineration, and the incineration looks like it's a higher cost.

Well, the equation isn't quite fair because what you've left out on the side of the impermanent land disposal remedy is the fact that in the future there's going to be costs involved. It's easy for economists or for people at OMB to discount those future costs, to say it just doesn't matter. It's going to be 10 years or 20 years down the road.

Mr. OBERSTAR. Very important for the purposes of this inquiry and for the purposes of this program, at this stage is EPA developing, on a programmatic basis, a schedule of costs that take into account the factors you've just cited--size of the material to be disposed, whether in tonnage or volume, expressed in gallons or barrels. Are they at a point now where there will be some consistency, so that two sites with similar toxic substances to be disposed of by destruction technology will be done on the same basis, or in very different ways?

Mr. HIRSCHHORN. I would say—right now I would say the answer is no, and I say that because we're looking at Records of Decision and Feasibility Studies which are coming out of the system right now, and people are not using the same database.

For what you say to be true, there would have to be a national consistent database that everyone is using. Now I'm sure people at EPA will say that that is worthy goal to get to, but we have looked at the training materials used by people at EPA to train other people at EPA; we have looked at the reports on cost that ORD people EPA have produced. I cannot see at this time any central, national database of accurate, up-to-date data on the cost of different cleanup technologies.

Different contractors and different offices of contractors and in different EPA regions are using different cost information.

Mr. OBERSTAR. You have cited the possible ambiguity in the SARA law revolving around the word "permanent." It was at least clear in our minds in writing the legislation that "permanent" meant that we would never have to come back to that site again and treat it further; and, in removing it, don't create a problem some place else for some other person or group of people.

What is your definition of "permanent"? You heard what I asked Mr. Thomas earlier. He said that the agency did a great deal of thinking in trying to write a program guidance on the word "permanent." What do you mean? What do you think that word means? How should it be handled by the agency?

Mr. HIRSCHHORN. Permanence should be the elimination of future cleanup actions at the same site for the same materials or at another site for the same materials, because clearly taking the waste away from one site and putting it into a landfill somewhere else, even if it's regulated, I emphasize, is not necessarily living up to that original view of permanent.

Clearly, people like to get rid of their problem by putting it somewhere else. I see a trend around the country that there is more interest now in not doing that.

Mrs. **Johnson**. Mr. Chairman, could I ask for a clarification on this point?

Mr. **Oberstar**. Yes.

Mrs. **Johnson**. It is clear in the Superfund law we expressly said that removal was okay if removal went to a qualified disposal site. Now you just gave us your definition of permanence, but that is not, in my estimation, the definition of permanence that was contained in the law because the law explicitly allowed that cleaning up permanently at a site could involve taking some material and putting it at another place if that place was now a qualified place as opposed to an unqualified place.

While I appreciate your talk about what you would like to believe is permanent, I think we ought to make a distinction between that and what the law indicated. I don't think there was any implication in the law that the writers of that law didn't recognize the need for some removal.

Mr. **Hirschhorn**. But if I may respond——

Mr. **Oberstar**. Going further, and I want you to respond to that, can permanent mean encapsulation? Can it mean stabilization? Can it mean—of course, it can mean destruction of the material. Can it mean other things than total destruction by incineration, whatever means?

Mr. **Hirschhorn**. Well, I find that technically——

Mr. **Oberstar**. Can it mean removal to an approved site some place else?

Mr. **Hirschhorn**. I think one can justify in some cases not using a permanent remedy, but the burden is——

Mrs. **Johnson**. That's not my question, though. My question is: in the law that we passed there is no implication that the definition of permanence at one site in that law doesn't include transport to another site. I think that's important because the idea you're putting out of permanence, while I think it's one that we would all like to entertain, is one that we rejected when we wrote the law, because we believed we couldn't require that.

I believe the Superfund law is clear that permanent cleanup at a site does allow off site removal—I think it's interesting what you think would be nice, but it's not relevant.

Mr. **Hirschhorn**. Well, I would say this: the law does not require a permanent solution. The law expresses a preference for a permanent solution and gives some flexibility and acknowledges the fact that it is not always possible to obtain a permanent solution, but there is a difference in saying that the remedy selected is not permanent versus saying that the remedy is permanent when, in fact, it is not permanent. I think that's the point that I am trying to make.

I had no problem seeing a good case made for selecting an impermanent remedy, but acknowledging it as an impermanent remedy. What we see now is something that one Record of Decision says is not permanent—it says it. It's chosen somewhere else and the same Government, the same agency somewhere else says that that technology is permanent in that case.

I don't think you can have it both ways, but I think it is possible and the law clearly provides the opportunity for not using a permanent remedy, and there are technical cases definitely where with today's technology it would be very difficult to achieve a permanent remedy, but the point I want to make is that the Record of Decision is supposed to make the case; it's supposed to make the Government's case for not selecting a permanent remedy and ignoring the preference or whether it has ignored the preference, I should say, for a permanent remedy. That is the issue that the analysis is supposed to direct: has the preference for permanent remedy been fully addressed in the work at the site or have we thrown out a possible practical permanent remedy for some reason which is not really applicable to the situation?

Mr. OBERSTAR. The law is instructive. The law in section 121 of SARA says, section 121(b)(1), "Remedial actions in which treatment which permanently and significantly reduces the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants as a principal element are to be preferred over remedial actions not involving such treatment. Offsite transport and disposal of hazardous substances or contaminated materials without such treatment should be the least favored alternative remedial action."

That's what I was getting to—is removal of the substance permanent? The law wording says it's the least favored.

Mr. HIRSCHHORN. Exactly; and that's the whole purpose of the record of decision—to——

Mr. OBERSTAR. Make the case for one or another alternative——

Mr. HIRSCHHORN [continuing]. Make the case.

Mr. OBERSTAR [continuing]. And what is permanent.

Mr. HIRSCHHORN. It would help, I agree, it would help a great deal if there was guidance with a clear, unambiguous interpretation of what permanence means, because now, quite frankly, we see permanence applied everywhere for anything that is done. I mean, if you leave it in the ground and put a clay cap over it, it can be called permanent. If you take it to a landfill, it is called permanent. Virtually the application of any technology whatsoever around the country has been called permanent in Records of Decision.

Mr. OBERSTAR. It may be permanent if that alternative landfill is approved, is sealed off, is a site from which there will be no mobility, movement of substances.

Mr. HIRSCHHORN. I would like to add, exactly on that point, that it's possible to find EPA documents where EPA itself says that no landfill, period—that no landfill—can be assured to provide protection for an infinite amount of time. Essentially, that's EPA's position itself and it is in some Records of Decision and Feasibility Studies—that any form of land disposal will fail at some point in time. It's just a question of when.

Now, then, we get into again a subsidiary issue—can the regulatory system discover the failures of even regulated landfills, and then we get into the issue of compliance and noncompliance, enforcement. Enforcement means maybe catching a failure; it doesn't mean eliminating a failure; for example, a breach of a liner or something like that.

There is just a cascading series of uncertainties if you pick a form of land disposal. Again, I emphasize that in EPA's own records of decisions at some sites such as Pristine in Ohio they have made an absolutely solid case that any form of land disposal is not permanent and does not meet SARA's provisions.

Mr. OBERSTAR. Thank you.

Mr. Clinger?

Mr. CLINGER. Thank you very much, Mr. Chairman. I apologize for not having been here for the preliminary part of the questioning, so if I repeat any of the questions, please tell me.

I was concerned a little bit when EPA was testifying earlier. They were asked if there had been any dialogues between OTA and EPA on this issue, and I agree with them that this should be a cooperative effort—where the failures exist, that hopefully we would be working together to address those problems and resolve them.

Was that a fair statement, that there hasn't been this——

Mr. HIRSCHHORN. No, I think there has been. We have gone over to EPA many times. We have an advisory committee the way OTA functions. EPA personnel have attended our meetings of our advisory committee on this project. That's access to our telling our peer review panel exactly what's going on in the study. There has been, I would say, a fair amount of communication.

Mr. CLINGER. On a fairly routine, systematic basis?

Mr. HIRSCHHORN. I wouldn't say it's routine. I wouldn't say that, but there has been communication.

We constantly are asking EPA for information. As I say, almost all of the data and information we get has come because EPA has provided it to us.

Mr. CLINGER. But have you given them an opportunity to date at least to respond to some of the very serious charges that you are bringing against them? Have they had an opportunity to really react to that at any point thus far?

Mr. HIRSCHHORN. Not in a formal way. I would say in an informal way, certainly they have.

Mr. CLINGER. What is the procedure? Is there a procedure here where they would have an opportunity to respond?

Mr. HIRSCHHORN. OTA does not formally have a procedure where we provide the documents to the Executive branch agencies to review.

Mr. CLINGER. Like GAO, for example?

Mr. HIRSCHHORN. GAO doesn't necessarily do that, either. It's an option of the requester.

Mr. CLINGER. Well, it just does seem to me that you have really raised some serious concerns, and I think that we're all, as you have indicated, as EPA has indicated, we're all interested in the same thing, and that is to have an effective program that is addressing what is a very serious problem in the country. I would hope that that would be, should be a cooperative effort, not an adversarial one, to accomplish that universally desired goal.

The other item I wanted to talk about—you really have painted a pretty bleak picture, I think, of what the situation is at the present time. One of the things that you suggested is that there is inconsistency among regions as to enforcement of standards. Is that a serious problem? In what way are they being inconsistent? Are there some that are doing a credible job and others, in your view, that are not doing a credible job?

Mr. HIRSCHHORN. I think it's hard to generalize and say that one region consistently is better or worse than another region, but you do see on a site-by-site basis enormous differences where you see the same kind of problem site.

I was giving the example of Crystal City, a pesticide-contaminated site from a crop dusting operation. I found another site just like that in Florida. There were two different regions involved here with two completely different remedies selected.

Mr. CLINGER. But an identical factual situation?

Mr. HIRSCHHORN. Yes, two very similar sites. What I found interesting, in one case a technical reason was invoked to reject incineration and yet incineration was chosen at the other site and that technical factor was never even brought up, not even mentioned. Something that got extreme importance in order to reject incineration at the one site didn't even come up in the discussion for selecting incineration at essentially an identical type of contamination in another State in another region.

Mr. CLINGER. To what do you attribute that? In other words, you're saying that there is not significant, effective guidance from national headquarters to the Regions as to how they go about selecting the best remedy?

Mr. HIRSCHHORN. The regional offices have an enormous amount of autonomy, flexibility in implementing Superfund. The guidance that comes out of headquarters is either written vaguely or is not proscriptive. It may state some sort of preference or desire or goal, but it may provide ample flexibility for the regions to do quite different things.

Mr. CLINGER. Thus far at least, I take it as far as you've gone in your work, you have not reached the point of making recommendations as to what should be done, or have you?

Mr. HIRSCHHORN. No, we've begun that process, I would say. We hope to finish this project sometime in the fall and have a report for the Congress in early 1989. The last thing that we do after we think we've gotten the best information that we can and done the analysis and understood the problems, the last step is get to what we call policy options for Congress and what Congress might be able to do to solve the problem. I think we've just begun that process, quite frankly, and I think——

Mr. CLINGER. There really isn't much in your testimony here today except pretty broad-based criticism——

Mr. HIRSCHHORN. I gave two hints in today's testimony because they are quite clear to us. One is if you want to reduce the time and cost of the remedial investigation feasibility studies, one technique would be to narrow down the field of alternatives early in the process, study less. In other words, do more in-depth study on fewer alternatives rather than pay the contractors to do a lot of study on a lot of alternatives. That's one fix that seems fairly obvious.

The other area that I mentioned is addressing the problems in the workforce. That is, if we have inexperienced people, there are techniques that management can use to address that inexperience to compensate for it; for example, providing better information, central databases. That would help young, inexperienced people if they knew that they could rely on data that came from a central EPA source.

Mr. CLINGER. I would assume that one of the areas that you might have recommendations at some point in time would be any changes that should be made in the law. You've suggested that we should tighten up at least or be more precise in what we mean by permanent. Are there any other suggestions at this point that you would suggest that we in the Congress should be addressing to make the program more effective?

Mr. HIRSCHHORN. I think the one that you mention is really the key one. Section 121 that deals with permanence in technology selection probably could be changed to reduce the level of ambiguity and variable interpretation that now exists.

Mr. CLINGER. You seem to also be suggesting at least that maybe SARA is misguided in giving too much emphasis to removal actions and that that had given the EPA an opportunity to kind of run amuck in terms of removal actions. Do you think that needs to be tightened?

Mr. HIRSCHHORN. Possibly. I'm not a lawyer, and scholars may argue the point, but it seems that the removal section is outside the scope of 121; that is, it's not clear to me that the preference for permanent remedy applies to removal action. If it did apply, it would mean a lot.

I would say to you I spent all weekend, in fact, reviewing documents on removal actions costing in the $2 million or more range around the country, and I, in fact, conferred with EPA, some EPA officials, after looking at the documents. We all agreed that removal actions have become in many cases identical to remedial cleanups in a technical sense. They have become the same thing.

If removal actions, especially large ones, are outside the scope of section 121 on permanent remedy, then that is an interesting matter. I have looked at documents from different EPA regions, and there are one or two EPA regions that have raised this issue themselves. They have raised the question: does 121 and the preference for permanent remedy apply to major removal actions? I would say that that is an unresolved issue both in the law and within EPA itself.

Mr. CLINGER. Just one final question at this moment: you indicated that where EPA negotiates with responsible parties, too often this has led to—almost in every case has resulted in a cheaper, less expensive remedy being applied.

I guess my question is: are responsible parties necessarily always and in every case, as you seem to imply, driven by cost or could they be more concerned with permanent cleanup, site delisting, and ultimately release from liability, and that those factors would be a part of their consideration, being able to accomplish those objectives with the least possible——

Mr. HIRSCHHORN. Absolutely. I couldn't agree more with you. In fact, we worked for several years, for example, at the Lipari site in New Jersey, a very interesting case, where we thought the EPA selected remedy would not work and was not really a permanent remedy. The responsible party agreed and took the same position. We've heard that from a number of responsible parties. Their fear is that the EPA selected remedy will not work and they will retain liability and, worse than that, that they will pay for a cleanup that will not work and also retain liability.

Clearly, that is correct. I think I suggest in my testimony, in fact, that it's possible that we will see a lot of litigation from responsible parties exactly on that point of technology selection, because if they think that the technology is not going to work, they are going to resist settlements and they may challenge these records of decision.

Mr. CLINGER. So that can be very beneficial to the program, as a matter of fact?

Mr. HIRSCHHORN. Oh, absolutely.

Mr. CLINGER. The result would be that you could have better, more long-lasting, permanent cleanups?

Mr. HIRSCHHORN. Another thing that would help, of course, is that they suffer within the same framework of ambiguity with regard to what permanence is. I mean, some of the responsible parties want to use a better treatment technology, but the same ambiguity exists for them: what constitutes the permanent remedy?

But we do see a number of cases where responsible parties have stepped forward and, in fact, have pushed innovative technology. I want to emphasize that the responsible parties, at their own expense in a number of cases, have done the field testing of innovative cleanup technologies to help advance that whole area.

Mr. CLINGER. Thank you.

Mr. OBERSTAR. The gentlewoman from Connecticut, Mrs. Johnson?

Mrs. JOHNSON. Thank you, Dr. Hirschhorn, for your testimony. It's very useful in a situation like this, implementing a very complex law with a lot of untested concepts and technologies involving a very large nation, to have someone looking at the issues that you have been looking at, and I appreciate that.

I wonder if in the course of our writing the Superfund bill you testified before this committee or any other committee either in support or opposition to mandated schedules.

Mr. HIRSCHHORN. We testified a number of times with regard to Superfund reauthorization. I honestly don't remember at this point whether we ever addressed that directly in testimony. I honestly don't remember.

Mrs. JOHNSON. I do think it's important from the point of view of the integrity of the system for all of us to recognize that most groups testified in support of mandated schedules. Most of us wanted mandated schedules. EPA accepted mandated schedules. We all knew perfectly well what the dangers and risks were of mandated schedules.

Some of the problems that you are pointing to here today were problems we knew might exist and were likely to exist when you create mandated schedules. Here we are 18 months after an agency has been trying to implement rapidly a very complete and new law through 10 regional offices trying to meet the schedules. The technology of cleanup which is not clear. The cost data is not in place. If we had implemented this law the way you have proposed—and I am not criticizing you; I just want to get this on the record because I think it's important—if we had done the things that you suggest to avoid the problems we have now—in other words, if we had developed uniform guidance, if we had developed the database, if we had developed firm cost information, I can tell you that EPA wouldn't have met the schedules in the law. It simply isn't possible. It's not there.

Given the limits of cost and the limits of the workforce and the limits of knowledge of data, technology, and all those things, it's not possible. I think we ought to be honest about that because, unfortunately, one of the small hypocrisies that Congress allows itself is to indulge in this kind of debate before a bill and in the course of a bill, knowing perfectly well that when we put schedules in there we force agencies to try to press. We're doing it to force them to press. We know in an area like this that's the opposite of the kind of rational procedure that you would have liked to have seen laid out. On the other hand, you, yourself, said at the beginning of your testimony that new sites are coming to our attention more rapidly than we can clean up the ones we have.

To be honest and realistic about this, we are in a bind created by reality. That does not in any way compromise the importance of your work in looking over what the Regions are doing, so that we can move toward a more uniform application, so that we can learn more rapidly from experience, which EPA is obviously having a hard time doing because they are so busy trying to implement this thing and meet these schedules.

I think it would be unwise not to recognize the very broad implications of the schedule provisions in the bill because they do, indeed, when combined with the workforce problems and the dollar limits, drive a lot of the problems that you refer to.

There are some other things, however, in what you said that are I think worth a little more discussion. Your rather broad condemnation of separation and stabilization in the context of the law's preference for permanent cleanup surprised me. First of all, separation can radically reduce the quantity of those materials that endanger our environment. That, it seems to me, in and of itself is valuable. If you have less to manage, you might be able to manage it more wisely. I would certainly not want to discourage EPA from using a separation for the purposes of reduction.

EPA couldn't say vitrification will provide permanent treatment in the sense of a million years or 100,000 years or maybe even 5,000 years. I think there's a reluctance to say this is permanent. Nonetheless, vitrification seems to me to offer a great deal as a stabilization technology. When you weigh all the factors of cost and technology, and so on, I wouldn't want to see that kind of technology discouraged just because it does retain the substances in the land and at the site.

Do you mean in your earlier statement in regard to the permanency issue—did you mean to indicate as broadly as it seemed to me you were indicating opposition stabilization methods such as vitrification and separation for the purposes of reduction?

Mr. **Hirschhorn**. Well, let me clarify. With regard to separation technology, its best use is if it precedes some form of destruction; that is, if you separate and concentrate, then it would be nice if the last step in the process destroyed that which you separated and concentrated.

My concern with separation is that the way it is so often implemented is that that which is separated out is put back directly into the atmosphere or the water or, in fact, is collected and sent to a landfill.

You're absolutely correct——

Mrs. JOHNSON. Wait a minute. Let's get this straight. Nonetheless, isn't separation better—in other words, if you separate it out and take it to a landfill, at least you know what you're doing, whereas if you don't separate it out, then you may not be able to move it at all.

Mr. HIRSCHHORN. My point was going to be that it is a very good way to help reduce overall cost if, in fact, you use the smallest amount of destruction technology, perhaps something like incineration, after you've concentrated that which is hazardous.

My concern is not whether or not it's used; it's whether or not it's used in conjunction with destruction technology and whether or not it is mislabeled as reducing toxicity, which it doesn't. In fact creating a more concentrated mass of the hazardous material could work just the opposite way; it could be in a more potent form to do damage than when it was in a more diluted form at the original site.

So it's not a question of either/or; it's a question of appropriate use of a technology.

It's the same with stabilization. There are some excellent uses for stabilization. Ironically, the best use of stabilization—and this is uncontested in the technical community—is when you have contaminants which are toxic metals: chromium, lead, arsenic. You cannot destroy elements. You cannot incinerate them and destroy them.

What's interesting is that stabilization is often not used for that application. The Schmalz site in Wisconsin is contaminated only by heavy metals and they decided not to use stabilization, which is relatively low cost, for exactly the kind of contamination that it is perfectly suitable for. Instead, I would say to you that the technical community will probably quickly reach consensus that stabilization is just very, very uncertain if you have high concentrations of diverse, organic chemicals. It is exactly that situation where it is being selected around the country to solve that kind of complex problem.

Yes, stabilization—you can take complex sites and incinerate the material and your residue from incineration, for example, might have lead in the incinerator ash. The perfect use of stabilization is on the incinerator ash which contains the toxic metals or in biological treatment it's the same problem. The biological treatment may leave a metal residue in whatever is left over. That, too, is a wonderful application for stabilization.

The problem I raise is using stabilization as if it were comparable to destruction technology.

Mrs. JOHNSON. So you would call stabilization of metals permanency?

Mr. HIRSCHHORN. Well, it does not reduce toxicity, but then I would say to you there is no way to do that. There are——

Mrs. JOHNSON. There is no permanency in that instance?

Mr. HIRSCHHORN. Well, it reduces mobility and, in fact, it will increase volume and do nothing for toxicity.

Mrs. JOHNSON. Which is exactly why the law requires that you do whatever you can to reduce toxicity, volume, ability to migrate, and work toward permanency.

It seemed to me in some parts of your earlier testimony—it's always frustrating not to be able to question in the course of testimony because then you end up with a certain vagueness, I think, in the communications thereafter.

I think it's terribly important in criticizing any one technique to recognize its validity within the constellation of options. We will have to use separation, in my estimation, and I would certainly not want to discourage EPA from using separation or from believing that it's indefensible before the Congress. Likewise, stabilization—or that we have illusions as to the issue of permanency and what we can and cannot guarantee to the public.

As we get further into the oversight of this matter, I hope that your office will be as realistic as we need to be in the use of this terminology, because if we begin to set up the standard of permanency as complete detoxification of everything at a site with no transfer, we will not be able to meet it.

I think your own estimates at the beginning of your testimony of the possible cost of this program, I think you were $500 billion. For those of us who sit on the Budget Committee and know that Medicare is going to go from $45 billion to $95 billion in three or four years without any changes in current law, we understand the pressure and the options that we're going to have to deal with.

As you oversee this, I would urge you to pull back a little bit and try to be as realistic as possible in evaluating what can and cannot be useful in achieving the goals of Superfund.

Mr. HIRSCHHORN. A useful concept is to think of a hierarchy. We have the best at the top and then we go down and we think of other alternatives which cannot do what it is above it.

I think what we are saying in Superfund technology selection is that the thought process, the logic that ought to be used is that you start at the top, see whether it's applicable, practical, necessary, and then work your way down.

The problem that we see going on is that people jump immediately to a lower level of technology without making the case that that is sufficient or that something above it was impractical or too costly or whatever.

But it's making the technical case that is so important. I did not say, nor have we ever indicated, that the concept of preference for permanence is wrong. I think the preference is interesting.

Requiring permanence would be technically impossible at all Superfund sites. There are some situations where you can't achieve that kind of permanence that we have been talking about.

I think it is honest to say that it is possible for technical people, scientists and engineers, to be forthright and honest about a particular situation, say what is or is not feasible or applicable in that case.

Mrs. JOHNSON. For those of us who are interested in reuse, certainly in my estimation, land containment is often not only desirable because it is cheap, but desirable because there is a possibility of reuse if land containment can be done without hazard. There are some instances in which containment may not be worth it except in the very long run and we should look at retaining some of it for reuse.

I appreciate your testimony. I don't disagree that we have to look rigorously and rationally and from the top down, but I feel that you err somewhat making it look too simple. If we narrow the options as you were recommending as one possible course, that's easy for you to say. If the Agency comes here, having narrowed the options, and we don't agree with how they narrowed them, I'll tell you there's going to be hell to pay.

I don't want them to narrow the options too much. Everything is a matter of judgment and balance, and they do have to balance their economic resources when they look at the options they have to look at their workforce resources; they have to look at technology resources. I think we have an obligation to the public to be realistic and upfront about the limits within which they work so that we don't imply in our criticism that they could be permanently cleaning up; that there is a perfect set of things that, if looked at from the top, it would all fall out logically and we would all agree; that it's possible in 10 regional offices where every site is different to have quite the continuity of direction and specificity and uniformity that you're implying.

That's what I fear in your testimony, Dr. Hirschhorn. That's why I've gone into this at some length. I fear that this implication that it's possible to do more than we know it is possible to do, given the state of knowledge, given the resources, will mislead the public and set ourselves up for dishonor because we will set ourselves up for failure. That's what we did with the mandated schedules and we knew we were doing it. That's why we, luckily, had the good sense to step back on the most extreme set of schedules that was proposed to us.

I think it's of enormous importance that we be honest. I do appreciate your work. It is very important to have someone like you looking over EPA's shoulder and looking at these issues, and that will help them and us to move forward more rapidly toward those rational goals that you support.

Thank you.

Mr. **Oberstar**. I want to proceed to EPA, but briefly, with respect to the realism the gentlewoman talked about, it is not for OTA to address realism. Their task is to evaluate the performance as measured against the law. It's for Congress to decide whether the performance and the law reflect the kind of realism that we want.

The charge to OTA was evaluate the performance of EPA against the law as written by the Congress. It's for us, on the basis of that evaluation and our assessment of EPA's performance, to decide whether that law needs modification, change, and ultimately we'll come to that point.

Mrs. **Johnson**. Mr. Chairman, that's exactly why I wanted to differentiate between Dr. Hirschhorn's idea of permanency and what the law required about permanency. It's going to be tough because the law is contradictory to some extent, but we want to be certain, I agree with you, to try to tie these matters down to the law.

Thank you.

Mr. **Oberstar**. The next point is that there is some flexibility in the law. The question is, which OTA is attempting to assess for this committee, whether EPA is making the right choices about flexibility and whether they are evaluating those choices properly on the basis of the charge to EPA in the law that Congress has written.

Now we have a period of time for evaluation, and, of course, this is phase 1 of OTA's work. The second phase is the recommendations to Congress, and to EPA, that will come out of this analysis which we asked them to undertake.

You have said that EPA's planning to eliminate 40 percent or more of the sites at the PA step in order to reduce the workload. Would you explain that further?

Mr. **Hirschhorn**. Well, again, one way to help at the end of the pipe to meet the performance goals and the mandated schedules is to eliminate more sites at the front end of the system. The original concept behind a preliminary assessment was really a very simple one. The idea was to make sure that the site existed. That is, people would phone in sites and sometimes the site didn't exist or sometimes the same site would have two different names.

The original concept was to eliminate what would probably be a small percent of the sites for those kinds of reasons. They were sort of technical or bureaucratic. It didn't have to do with environmental protection; it had to do with other things about the site.

What has happened increasingly is that EPA is using some sort of criterion to make a judgment very early in the process when there is very little data on the site. They are making a judgment as to whether or not that site is important enough to warrant a Superfund cleanup. This means that they are using their hazard ranking system early in the process. The hazard ranking system which is supposed to be revised, and will be revised, was meant to be used when you have a lot of reasonably good data to evaluate a site.

At the preliminary assessment step there's very poor data, and yet they are moving that evaluation system into the front end. They have decided bureaucratically to eliminate more sites.

I would say that that is a very invisible part of the process. As I pointed out, many sites that do require cleanup will not pass through the system, but essentially will fail the original test used now at the PA stage, and they may not get attention.

I pointed out in your State of Minnesota—I think you were out—that 50 percent of the sites in Minnesota that the State says have to be cleaned up would not make it through the EPA system. Some States have a safety net. They're catching the sites that are not passing through the Federal system. Most States do not have that kind of safety net. So that more and more sites will fail and will pass out of the system at the earliest possible stage and without a really good case being made, because they have not been studied or examined or tested at that point.

They may only get worse over time and eventually they would become more visible as problem sites. Obviously, the more you leave a site sit there, if it is a problem site, it's going to get more and more difficult to clean it up.

The costs of cleanup probably going up exponentially the longer the sites sit there unattended. That's the problem with the change in this front end of the system right now.

Mr. **Oberstar**. Are you saying that EPA consciously is eliminating sites because the cost of doing this in their judgment may be too high or because, on an objective analysis, they don't meet the criteria? Are the criteria wrong?

Mr. **Hirschhorn**. I would say the criteria are what they decide they are, and that is a somewhat subjective judgment as to what merits Superfund attention. What they've done over time is up the cutoff, so to speak. They've made it more difficult for sites to stay in the system. They've made it easy to eliminate sites at the very beginning of the system without having studied, I emphasize, without any evidence to discover whether or not they are making a mistake in their judgment; that is, whatever test, whatever logic they are using, would it create false negatives? Would sites slip through, fall out, that really do require a cleanup?

They haven't attempted to discover whether or not there is a false negative problem.

Mr. **Oberstar**. Thank you very much, Dr. Hirschhorn. There are many other aspects of your testimony that I would like to go into and explore further, but we just simply don't have time this afternoon to do so. I want to hear the reaction from EPA. Of course, as I said at the outset, this is the beginning of a process of review of Superfund and we will have occasion to revisit the subject at another hearing.

Mr. **Hirschhorn**. Thank you.

Mr. **Oberstar**. Thank you very much.

[Mr. Hirschhorn's prepared statement and responses to supplemental questions follow:]

STATEMENT OF

DR. JOEL S. HIRSCHHORN

SENIOR ASSOCIATE

OFFICE OF TECHNOLOGY ASSESSMENT

BEFORE THE

SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT

COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION

UNITED STATES HOUSE OF REPRESENTATIVES

April 20, 1988

Thank you Mr. Chairman for giving OTA the opportunity to discuss some preliminary information from our ongoing Superfund Implementation assessment. In particular, I will draw on case studies of recent selections of cleanup technology at Superfund sites. At your request, the case studies will be presented in a special report to be released later this Spring. An important aspect of our approach to understanding the effectiveness of cleanups is to examine work at different Superfund sites to see whether we are learning from experience and whether the program is being implemented with consistent data and policies.

Our work is focused on understanding how the 1986 Superfund Amendments and Reauthorization Act (SARA) is being implemented, with special emphasis on several major technical issues. Finding better solutions means moving beyond traditional issues which are centered around who is to blame and who is paying how much. The paradox is that so much is at stake in Superfund that it is easy to lose sight of the basic environmental mission of the program. Are we eliminating contamination from soil and groundwater expeditiously, effectively, permanently, and without transferring risk from one community to another?

We are trying to identify implementation trends and trying to understand whether there is a coherent, efficient, and effective national strategy for cleaning up contaminated sites. Our goal, like everyone else's, is helping to make the Superfund program work better. However, I must say at the outset that we have disturbing information to report. And whatever we say is more unsettling when we realize that the problem Superfund is designed to solve is growing faster than the delivery of solutions.

Our analysis of EPA data shows that at the end of the second five year reauthorization period -- after more than $10 billion will have been spent -- there will be considerably more contaminated sites to be cleaned than we had to begin with. This outcome is inevitable. The total time for a site to move through the Superfund system to a final cleanup is often about ten years. Every month, without letup, more sites requiring cleanup are identified, even though the government has no site discovery program and is sending many sites into several other cleanup programs that do not assure effective cleanups. Because of new information, our 1985 estimate in Superfund Strategy -- that ultimately $300 billion will be spent by Superfund, States and industry to clean up sites -- may prove low.

Let me use plain language to sum up what we have found from our research and analysis and from our case studies:

--Public expectations are not being met by the current program.

--Large amounts of money are being spent, and in too many cases little protection of public health and environment is being obtained..

--Decisions about cleanups often lack a sound technical basis but take a long time to make.

The evidence shows that Superfund is not working. This challenges us to find out what is wrong and fix it.

First, I will discuss several aspects of the central issue of technology selection, using information from our case studies. Then I will examine two related issues: the unintended consequences of SARA's mandated performance schedules and the cross-cutting problem of an inexperienced national cleanup workforce.

Better Cleanup Technologies Are Often Not Selected Even Though They Are Practical

o Although SARA provided clear direction to use permanently effective waste treatment technologies instead of shipping waste to landfills and leaving wastes in the ground, the system still relies heavily on techniques that do not permanently destroy hazardous materials.

EPA's data on all FY87 RODs indicates that destruction treatment was used in only 19 percent of the cases, and even then the contribution of the technology to the whole cleanup is uncertain. Land disposal and containment approaches were used in 42 percent of cleanups. Although reliable data are not available, our impression is that a much higher percent of State cleanups outside of the Superfund program use land disposal and containment.

In removal and interim actions, hazardous wastes are often shipped off-site before a Record of Decision (ROD) is issued and a remedial cleanup implemented. SARA provided more funds and time to conduct these pre-remedial actions, but they are outside the requirement to use treatment cleanup technologies. At site after site we have examined, removal actions take waste away to landfills, often in greater quantity than remains for the remedial cleanup. Hazardous wastes in their original containers and on the surface of sites are not likely to be left for a remedial cleanup. Remedial cleanups deal with the leftovers -- contaminated soil and groundwater primarily, and sometimes buried waste. From the narrow perspective of the site to be cleaned this approach seems acceptable. But from a broader perspective, off-site land disposal means that the hazardous waste problem rides a merry-go-round.

Interim site actions are important because they cut immediate risks and prevent sites from getting worse, but often they seem to substitute for permanent cleanups and they can make the remedial cleanup more difficult. For example, at the Crystal City site in Texas, early removal actions buried hazardous material at different locations on-site; for the remedial cleanup that same material is to be dug up and reburied in an untreated form in an unlined landfill on-site. The estimated cost of the final cleanup is $1.6 million.

At the Lee's Lane Landfill site in Kentucky an EPA emergency response contractor performed an expedited response action at a cost of less than $3 million. The action did not treat the wastes and covered two hot spots of contamination (comprising less than an acre) with clay. EPA now considers the site cleaned up and, therefore, it is unlikely to receive further attention. That is, this action bypassed SARA provisions which apply to a remedial cleanup, including the preference for using permanent treatment technology, analysis of future land disposal failure and costs, and compliance with existing environmental standards. Therefore, SARA's provision to increase the time and spending for removal actions may be counterproductive to using treatment remedies rather than land disposal.

Our case studies show that some environmental problems are ignored or discounted in order to justify land disposal, or monitoring is used as a strategy to delay making a cleanup decision. RODs which speak of permanent solutions often have no certain outcome. At the Compass Industries site in Oklahoma, for example, the ROD says that the "remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable." The selected remedy is leaving the hazardous wastes in the ground and capping the site. There is no commitment to treat contaminated groundwater which is flowing into the nearby Arkansas River. The ROD says the site contains 620,000 cubic yards of hazardous material consisting of 12 inorganic and 33 organic priority pollutants. The estimated cost of the remedy is $12 million. The ROD's analysis of cleanup options gives capping two higher levels of ranking for reduction of toxicity and volume of waste than the no action alternative, even though capping does no more to reduce waste toxicity and volume than no action. Moreover, the ROD does not commit to future land use restrictions. Does the selected remedy offer certain permanent protection? Consider this statement from the ROD itself: "The potential for future fires and continued off-site migration of contaminants pose adverse human health and environmental impacts. Other impacts which the site may pose cannot be effectively predicted." Also, compare the choice of capping for Compass with the following statement on land disposal from the Pristine site Feasibility Study: "Because there is no treatment of soils to reduce the mobility, toxicity or volume [it] is not a permanent remedy...and [it] is the least preferred under SARA." The Compass site does pose a challenge for treatment remedies because of its large size. But there was very little consideration of sampling to discover hot spots of contamination suitable for excavation and treatment.

Not all treatment technologies offer the same level of effectiveness. Many remedial cleanups use separation technologies for contaminated soil and groundwater; these remove and collect hazardous material that is then shipped off-site for disposal. Technologies such as carbon absorption and air and steam stripping for groundwater, and extraction of volatile organic substances and washing for soil were selected in 10 percent of FY87 RODs and are increasingly popular. RODs generally ignore the exact final disposition of the collected hazardous material, which often can be destroyed rather than landfilled as hazardous waste. Names of separation technologies can be confusing; for example, low temperature thermal treatments just volatilize some organic chemicals, but do not destroy them.

Chemical stabilization techniques (also called fixation and solidification) are attractive because of relatively low costs; stabilization reduces mobility and, generally increases volume, sometimes greatly because large amounts of materials like cement are used. Its track record is good for toxic metals, but much more uncertain for broad ranges of organic contaminants for which it is currently being selected. At the Tacoma Tar Pits site in Washington, the Sand Springs site in Oklahoma, the Chemical control site in New Jersey, and the Liquid Disposal site in Michigan the RODs chose chemical stabilization to clean up soil contaminated with diverse organic chemicals without treatability tests to support the decision.

Stabilization techniques dilute or physically encapsulate hazardous material in a liquid which hardens; the mass is then landfilled. Various forms of stabilization were selected in 10 percent of the FY87 RODs. These techniques have not been proved to detoxify or destroy hazardous substances by altering molecular structures through chemical reaction. At best, different types and strengths of bonding between hazardous molecules and stabilization materials lead to different reductions in mobility of hazardous substances for different stabilization techniques. Some techniques are very crude and hazardous material may only be physically encased, and the tests currently being used to evaluate stabilization performance are so unsophisticated that they are easily passed. At best, this approach should be selected when other treatments are not feasible or practical, or as a polishing step after other treatment has been used. A proper use of stabilization was stated by the Liquid Disposal site ROD for a biological treatment alternative that would not be effective for all contaminants: "Solidification/fixation is required to treat inorganics and PCBs."

It is disturbing that the following statement appears in the Liquid Disposal site ROD which selected stabilization: "The remedy will reduce the mobility and toxicity of the waste by greatly reducing or eliminating the ability for hazardous chemicals to leach out of the solidified mass. However, hazardous chemicals still remain in that mass." Does stabilization reduce toxicity? At another point, the ROD says that the hazardous substances "will not be permanently destroyed." With the exception of one vendor's limited attempt, OTA has not seen scientific evidence that proves that stabilization actually alters the chemical nature of a broad range of hazardous substances and reduces their intrinsic toxicity. One should not confuse reduced mobility--which itself must be proven, but was not prior to the Liquid Disposal ROD--with reduced toxicity. This point is critical because RODs often rate stabilization equal to true destruction technologies for environmental effectiveness, which it is not.

Few people seem aware that in 1985 at the Conservation Chemical site in Missouri chemical stabilization was found to have failed. This failure complicated subsequent cleanup, particularly with regard to selecting another treatment approach, because there is now a large mass of ineffectively stabilized material. Indeed, this site is on its third remedial cleanup; in 1986 it was realized that a second remedial approach based on constructing a barrier around the site would not work; the 1987 ROD selected another form of waste containment instead of excavation and treatment.

There Are Several Reasons Why More Effective Technologies Are Not Being Selected

- An ambiguity in SARA is the root cause of insufficient use of destruction treatment technologies. SARA seems to allow cleanups that reduce the "toxicity, mobility, or volume" of hazardous material with technologies that do not irreversibly destroy hazardous substances. Nor has EPA taken a position on reducing toxicity over reducing mobility or volume.

There is also confusion about the term "permanent remedy." Many responsible parties take the position that traditional land disposal and containment alternatives, which invariably are the lowest cost alternatives, in the short term, are permanent. The defense of this position rests on interpreting SARA as not requiring reduction in toxicity, and on discounting the long term ineffectiveness of land disposal.

RODs also exhibit confusion over the issue of permanency, an issue of critical public concern. For example, in the Liquid Disposal site ROD, EPA says that the selected "remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable." Later EPA says "The selected alternative is not considered permanent because hazardous substances will remain at the site." Still later in the document EPA says "The proposed soil cleanup approach--solidifying and isolating--is considered a permanent remedy." SARA's term "to the maximum extent practicable" allows variable and often technically misleading statements, but clearly the government has a problem, in this and many other RODs, in understanding what the selected remedy really accomplishes or in presenting a document which has been carefully reviewed.

There are also other reasons why more effective technologies are not being selected: a short term view, problems with calculating costs, and the sheer number of new technologies competing for recognition and market share.

The statutory requirement to fully analyze the long term risks and costs of land disposal remedies is generally not complied with. At the Schmalz site in Wisconsin the ROD selected a simple earth cover--not a multilayered cap used on regulated hazardous waste landfills. Untreated contaminated soil will remain and the ROD did not commit to cleanup of groundwater, although the possibility is anticipated. The estimated cost of the remedial cleanup is $800,000, which is a very low cleanup cost. Even though the contaminants are toxic metals, and chemical stabilization is well proven and low cost, this option was not selected. Selecting land disposal cleanups in Superfund is partly due to the lack of dissemination of information about the failure of cleanup technologies. Potential cap failure did not receive adequate analysis in the Schmalz site ROD. But, for example, the clay cap being installed at the Winthrop Landfill site in Maine apparently failed sometime in September 1987, even before construction was completed. The November 1985 ROD for Winthrop said the technology was proven, routinely used, and posed no construction difficulties.

The Superfund system also has fundamental biases against newer waste treatment technologies, for example because of a desire to minimize immediate direct costs. In general, when we examine sites where impermanent remedies have been selected (and where the decisions are questionable), the estimated costs are millions of dollars less than effective cleanups. Cleanup alternatives which do not provide environmental protection comparable to true waste destruction techniques are said to be cost-effective when they are not. A major problem is inaccurate cost estimates. At the Pristine site in Ohio the on-site incineration alternative was estimated to cost about $50 million and was rejected on the basis of its alleged high cost. But the estimate used a unit incineration cost 2 to 3 times the correct value. Using incineration costs which are comparable to those used at several other Superfund sites (for example at the Davis Liquid Disposal site in Massachusetts where it was selected), we estimate a cost of about $25 million for Pristine.

The consequence at Pristine was that an unproven technology, in situ vitrification, was selected over proven incineration. (This technology is in the EPA SITE program, but it has not been tested yet.) In situ vitrification is a complex technology that destroys some contaminants, traps some and stabilizes them in the residual glassy material, and removes and collects others. Like every new cleanup technology, there are limits to what vitrification can do, and almost all information comes from its developer. However, in two cases where there has been independent testing and analysis, its performance has not been competitive with other treatment technologies. Nor are the site conditions at Pristine ideal for application of this technology.

We also looked at the rates by which direct costs were marked up to account for profit and contingencies in a number of Feasibility Studies, and found that they varied substantially; for example, from 83 percent at the Pristine site in Ohio to 29 percent at Crystal City in Texas. Inaccurate unit cost data coupled with arbitrary burden rates mean that just about any cost can be estimated for a cleanup.

On this cost issue, I add notes of optimism and caution. Treatment technology is not the enemy of cost-effectiveness. To the contrary, technological innovation is already delivering lower unit cost permanent cleanups. There is an enormous increase in promising and, sometimes, proven new cleanup technologies. R&D and the attraction of a multibillion dollar cleanup market are working to increase cleanup alternatives.

The number of new technologies entering the market means, however, an increased analytical burden to understand their advantages and disadvantages and exactly what problems they best solve. The burden for a largely inexperienced cleanup workforce is increasing, and this means we need effective training and effective, rapid information transfer. At a number of case study sites, the range of treatment technologies examined in detail was too narrow. More technologies also mean that a larger number of expensive treatability and demonstration tests should be done before decisions are made. More technologies also mean more competition and the need for more careful cost analyses and estimates. General rules of thumb can be particularly unreliable; for example, there is current talk about the very low cost of biological treatment. But most analyses have not made that case; for the Liquid Disposal site, the in situ biological treatment alternative was the second most expensive option for soil cleanup at $55 million, as compared to $68 million for incineration and $21 million for chemical stabilization.

Increasingly, the RIFS/ROD system needs to fine-tune its studies and decision-making processes to choose among many treatment technologies rather than make a simple choice between land disposal and treatment. We can't streamline the RIFS process, unless we can eliminate alternatives early in the study process, but this requires great expertise and informed, deliberate acceptance of risk. Treatment technologies already established in the marketplace, such as incineration, which people are familiar with, should not impede newer treatment technologies. Moreover, we should be alert to possible conflicts of interest. For example, some consultants performing RIFSs and some responsible parties own cleanup technologies; they will naturally be biased in favor of their technologies, which in some cases may mean less effective or unnecessarily expensive cleanups and a stifling of competition.

There Is No Basis For Choosing Some Treatment Technologies

- A new problem has emerged. It is the selection of treatment, but not necessarily destruction, technologies without having a good technical case for the decision.

Many site decisions are commendable because they choose treatment rather than land disposal. But the cart is literally before the horse because treatability studies are generally postponed until the Design Phase, which follows the ROD. In many cases, the absence of treatability test results undermines the reasonableness of concluding that the selected cleanup technologies are effective permanent remedies. I stress reasonableness because no cleanup technology selection, even in the best of systems, can be free of uncertainty and risk for complex cleanups. The problem is especially acute for chemical stabilization and separation techniques. RODs often do not go beyond asserting that these generic technologies offer environmental protection comparable to destruction technologies, which have higher costs.

Generally, only a generic cleanup technology is selected in a ROD. But increasingly there are major variations within a generic category and when a specific variation has not been tested nor selected the public (including the responsible parties) is at a real disadvantage in the public comment period. Moreover, the implementation of a generic remedy after the ROD is largely hidden from public view. For example, selecting biological treatment is one thing, but after the ROD the choice might be between using in situ treatment in which microbes are put into contaminated soil and using closed reaction vessels in which the soil is treated.

Also, we see technologies in the EPA SITE program, which is designed to demonstrate the effectiveness of newer technologies, being selected before the demonstration test results are obtained. This has happened at the Chemical Control, Sand Springs, and Pristine sites. EPA says the SITE program is necessary to obtain "sound engineering and cost data" and to "resolve issues standing in the way of actual full-scale application." With this purpose, how can those same technologies be chosen in RODs for full-scale cleanup before the SITE results are available? The problem is that the SITE program has been unable to deliver results as fast as they are needed in the marketplace.

Some responsible parties are taking the lead in getting new cleanup technologies used. For example, at two Superfund sites the responsible parties mounted thorough demonstration tests after EPA either expressed its preferred remedy or issued a ROD. At the French Ltd. site in Texas, site testing of bioremediation is likely to change the original decision to use incineration and cut cleanup costs by perhaps $100 million. And at the Tyson's site in Pennsylvania, successful testing of vacuum extraction is likely to replace the original plan to excavate contaminated soil and landfill it; it would cut cleanup costs by about $10 million. Responsible parties have to perform extensive testing to make their case for a change, admittedly driven by the interest to cut costs, but the government does not usually follow the same procedure for its original decision. Indeed, responsible parties are contesting some RODs that select treatment technologies without any solid test data to support their feasibility for solving actual site problems. Therefore, selecting technologies without a good technical case for them will impede enforcement and cost-recovery actions.

CASE STUDIES

The broad themes I have discussed above are illustrated in two of our case studies which I summarize briefly here.

o The Chemical Control site in New Jersey. Contaminated material has been left in place at the site with a layer of permeable gravel (which itself has become contaminated) placed over it from a previous removal action; large amounts of hazardous material were removed in several actions. The selected remedy will leave some untreated contaminated material on-site; leaching of contaminants into the adjacent river will have occurred over about a ten year period prior to completion of the remedial cleanup, scheduled for mid-1990. The ROD signed on September 23, 1987 selected an innovative chemical stabilization technology to be applied in place (in situ) to the contaminated soil. The ROD says that the selected remedy "is a permanent solution" and that it "satisfies the preference for treatment that reduces toxicity, mobility, or volume." But the technology is unproven. No test results are given to support its application and effectiveness. Its cost is uncertain. A treatability study which is estimated to cost $770,000 is postponed until the design stage. The technology is in EPA's SITE program, but no results have been obtained.

The point is not to find fault with the innovative technology which may, in time, be found effective. But the decision to use the technology for Chemical Control makes the cleanup an experiment. It is not known now whether the selected remedy is a permanent solution.

Moreover, the ROD claims comparable effectiveness to incineration, which is not the case; incineration is well proven and can destroy the organic contaminants, and stabilization can be used for the ash if its toxic metal content is high -- a proven application of stabilization. The analysis of incineration in the supporting Feasibility Study is not good. Two different unit costs for on-site incineration are used, and both are higher than currently available rates from vendors ($750 and $500 per cubic yard instead of about $300 per cubic yard). The amount of material assumed to be incinerated was larger than the amount of material assumed to be treated by in situ stabilization. The ROD says that incineration is three times more expensive than the selected remedy. But our re-estimated cost for incineration--$14 million versus the ROD's estimate of $22 million--shows that it might be comparable to the eventual cost of in situ stabilization, which the Feasibility Study preceding the ROD estimated could cost as much as $14 million. Indeed, at the design stage the estimated cleanup cost has climbed from the $7 million in the ROD to $10 million. Other possible treatment technologies were not seriously considered.

- The Renora site in New Jersey. Large amounts of contaminated material were shipped off-site for land disposal during removal actions, and more is to be sent to a landfill as part of the remedial cleanup. Over $4 million was spent on removal actions while only $1.4 million is planned for the remedial cleanup. The remaining contaminated soil is to be treated biologically. But no treatability test results or other information was used to show that the selected remedy would be effective. Biological treatment has many forms and it is very waste specific. At this time, biological treatment cannot be assumed to work for sites such as Renora, which has complex organic and toxic metal contamination. The ROD commits to groundwater monitoring but no cleanup. The chief reason for not selecting on-site incineration appears to be its higher cost, several million dollars more. At different places in the ROD, compliance with SARA's requirement for reduction in toxicity, mobility, or volume is described in three different ways: complete, substantial, and significant. This may indicate end of fiscal year ROD rushing (it was signed on September 29, 1987) or confusion over the capabilities of the selected remedy.

Statutory Schedules To Speed The Program Are Leading To Actions That Are Counterproductive

- SARA's tactic of mandating schedules of specific program outputs is leading to actions which are counterproductive to environmental protection goals. Bureaucratic ways are found to meet "bean counting" goals made necessary by the legislation, but the environmental mission of the program suffers in consequence. Superfund is seen as a pipeline which is delivering a product. But what is that product?

A good example is meeting pre-remedial Site Inspection (SI) requirements by eliminating more sites at the earlier Preliminary Assessment (PA) screening step without enough concern about false negative results; that is, inadvertently eliminating sites from the program which really require cleanup. Passing sites through the PA or SI that don't require cleanup -- false positives -- is less critical because subsequent studies identify the great majority of them. EPA data indicate that about 20 percent of sites have been eliminated at the PA stage, when very little reliable information is available on site contamination. Now, however, EPA is planning to eliminate 40 percent or even more of sites at the PA step to reduce the SI workload. On the basis of poor information, they are concluding that many sites do not have big enough problems to qualify for the National Priorities List. No attempt has ever been made to discover what the rate of false negatives actually is; this is something done routinely in the health care area but not in Superfund, even though health effects are the primary reason for cleaning up sites. Also, note that it can take years before a site receives a PA. As an example, EPA's data show that of 102 PAs completed in December 1987 for New York sites, 80 percent had waited 6 to 7 years. There should be no illusions about

Superfund's ability to identify problem sites quickly before they get a lot worse.

Another example is the pressure to do more Remedial Investigation/Feasibility Studies (RIFSs). EPA is directing contractors and responsible parties to complete RIFSs in 18 months. But we could find no analysis or information to support the feasibility of such a time period. In fact, our case studies show an average RIFS time of 34 months. The pressure to perform an RIFS quickly appears to be a major factor in limiting the range of treatment technologies examined and in postponing critically needed treatability studies to the design stage after the technology has already been selected. If we see a lack of technical quality in RIFSs taking nearly 3 years, what are we to expect in those conducted in half the time? The goal of cutting study time is commendable, but it will be counterproductive environmentally and, eventually, economically as well, unless the root causes of poor technical quality are addressed.

There is also evidence that mandated schedules have other unanticipated effects. For example, at the Liquid Disposal site EPA argued that it could not extend the public comment period on the Feasibility Study and statement of preferred remedy because of "Congress' desire to expedite cleanups, as evidenced by the cleanup schedules of Section 116 of CERCLA."

Information from the program indicates that even short term performance goals are not being met. For example, on January 15, 1988 (two weeks into the second quarter) EPA's Assistant Administrator for Superfund reported to the Regional Administrators about the lack of first quarter FY88 performance because "only nine of the 21 RODs [were] completed." On December 10, 1987 at a Senate hearing the Assistant Administrator said that "he has been on the phone to all the agency's regional administrators to meet their goal of 30 RODs for the first quarter of 1988." (Superfund, December 21, 1987) Indeed, the goals for the first quarter performance distributed on October 16, 1987 (two weeks into the first quarter) included 30 RODs, not 21. Seven of the nine completed first quarter RODs came from that group, while 2 others apparently were sites that were supposed to be acted on in FY87. Thus, only 7 of the 30 RODs established as goals at the beginning of the quarter were completed --less than 25 percent. Slippage of ROD completion occurs over the entire year as evidenced by end-of-fiscal-year ROD bunching to improve annual performance data; in the past two years two thirds of RODs have been issued in the month of September. ROD rushing likely reflects reduced technical oversight and responses to public comments.

When we examined the goals set for the second FY88 quarter we found five uncompleted first quarter RODs missing. This indicates more slippage; in fact, four of these five had already slipped from a FY87 performance goal. And, of the 48 sites listed as second quarter FY88 ROD goals, five are labeled with the statement "will slip to 88/3" and one "will slip to 88/4."

The Superfund Program Is Handicapped By A Largely Inexperienced Workforce

- Superfund has grown explosively. The single biggest cross-cutting problem facing Superfund implementation is a workforce which is largely inexperienced, untrained, and characterized by high turnover rates.

Growth in spending is causing more and more companies to enter the cleanup market. In the consulting industry which performs nearly all Superfund work, inexperienced people are churning out paper, but the reports lack technical accuracy and comprehensiveness. Few experienced people exist, because the field is so new and is growing so fast. People with the most technical experience become managers who are more concerned with marketing and contract administration than with everyday technical work. We haven't found effective incentives for quality work nor attempts to measure quality. According to our case studies, reports are produced to satisfy requirements, but they do not seem to get checked very carefully. I'll give just two examples to illustrate what I mean. In addition to the Liquid Disposal site ROD which said that the selected remedy was both permanent and impermenent, consider the Pristine ROD that speaks twice of the site's soil having "high moisture content" when it rejects vacuum extraction of volatile organic chemicals. However, in its defense of in situ vitrification, the ROD says 4 pages later "the moisture content...is not high." Either high is high, or actual measured values could be used to show it is high for one technology but not too high for the other technology, if that was the case; however, no actual data are used.

In government, recent college graduates are in charge of multimillion dollar projects. There is no time to learn and few people to learn from. These junior people are expected to stand up to the pressures from senior contractor managers they are supposed to oversee. A number of government policies, some outside of EPA's domain, make it difficult to pay competitive salaries and offer working conditions comparable to those in the consulting industry. We see no likely letup in high Superfund staff turnover at EPA.

Many of the problems we find in RODs and their supporting RIFSs can only be explained by one factor: There are insufficient management controls or guidelines in government agencies or consulting companies to assure technical oversight and quality control. Many actions which could be used to compensate for the limitations of the workforce have not been seriously examined or implemented. We are nevertheless optimistic about the feasibility of instituting new activities to improve workforce capabilities; we will discuss these in our final assessment report.

However, in the near term, all expectations about improving the efficiency and effectiveness of the Superfund program must be tempered by recognizing the limits of the technical workforce. Much is to be gained from recognizing the necessity of developing capabilities in the Superfund system and pacing its work for a multi-decade effort. Unless ways are found to improve the national cleanup workforce and institute effective quality controls at every stage of cleanup, public confidence will erode and enforcement and cost recovery in Superfund will also suffer.

In the worst case scenario, large scale spending and continued changing of policies, including fragmentation of the national cleanup effort into many different Federal, State and private programs, will mask an underlying gridlock in which few sites move to cost-effective permanent cleanups. The problem will keep growing faster than the solution.

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Congreſs of the United States
OFFICE OF TECHNOLOGY ASSESSMENT
WASHINGTON, DC 20510-8025

To: House Public Works and Transportation Subcommittee on Investigations and Oversight

From: Joel Hirschhorn

Date: May 25, 1988

Responses by Joel S. Hirschhorn to questions for the April 20, 1988 hearing record:

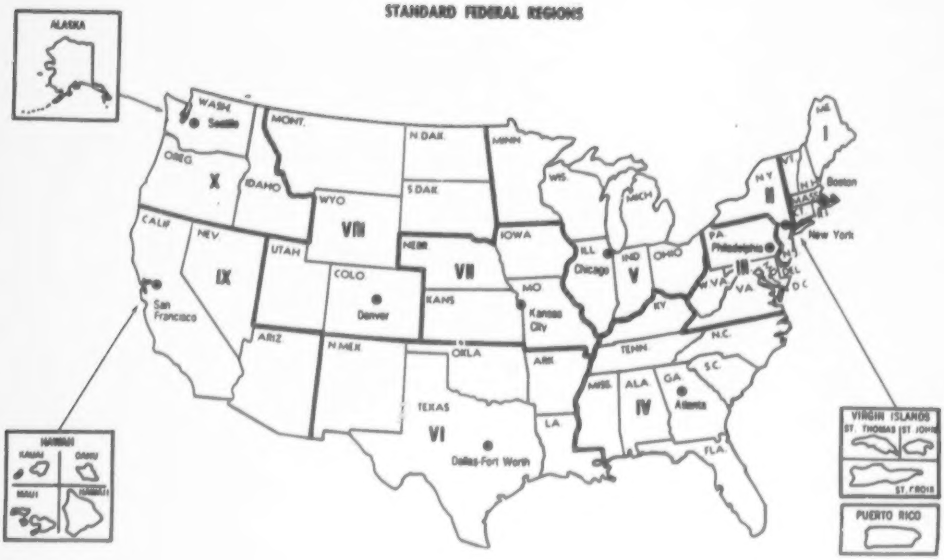
Q.1--How did you select the specific sites and RODs reviewed in your testimony?

Answer: The sites and RODs were selected from recent RODs, from September 1987 through December 1987, which EPA has acknowledged came under SARA. OTA had identified issues in its 1985 study Superfund Strategy and in the current Superfund Implementation study of which the case studies is just one part. This other work helped in the selection of representative case studies. The sites were chosen to illustrate different technology selection problems, none of which are unique to these sites, and to illustrate different types of sites and hazards. Our forthcoming report, which my testimony made use of, discusses about 10 percent of all recent RODs to which EPA has applied SARA, and we examined nearly all recent RODs - over a hundred - to verify that the case study sites are representative.

Q.2--What were your major sources of information used in your testimony?

Answer: Our primary data sources are EPA documents. Some information also comes from the general technical literature and from reports by responsible parties.

STANDARD FEDERAL REGIONS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ST. THOMAS
ST JOHN
ST. CROIX
PUERTO RICO

Sites mentioned in the 4/20 OTA testimony:

Chemical Control (NJ)
Compass Industries (OK)
Conservation Chemican (MO)
Crystal City (TX)
Davis Liquid Disposal (MASS)
French Ltd. (TX)
Lee Land's Landfill (KY)
Liquid Disposal Site (MICH)
Pristine (OHIO)
Renora (NJ)
Sand Springs (OK)
Schmalz site (WISC)
Takoma Tar Pits (WA)
Tyson's (PA)
Winthrop (ME)

3/88

FISCAL YEAR 1988 RECORDS OF DECISION (RODs)

Region	Site	Date
1	Cannon, MA	3/31/88
1	Keefe, NH (subsequent)	3/21/88
2	American Thermostat, NY	1/7/88
2	Love Canal NY (subsequent)	10/26/87
2	Nascolite, NY	3/31/88
2	York Oil, NY	2/9/88
3	L.A. Clarke, VA	3/31/88
4	Zellwood, FL	12/15/87
5	Eau Claire, WI	3/31/88
5	Forest Waste, MI (subsequent)	3/31/88
5	Lasalle, IL (subsequent)	3/31/88
5	Pristine, OH	12/31/87
5	South Andover, MN	3/31/88
6	French LTD, TX	3/24/88
6	Midland Products, AR	3/24/88
6	Odessa Chrome I, TX (subsequent)	3/18/88
6	Odessa Chrome II, TX (subsequent)	3/18/88
6	Sol Lynn, TX	3/25/88
7	Cherokee County, KS	12/21/87
8	Central City, CO (subsequent)	3/31/88
10	Frontier Hard Chrome, WA	12/30/87

Page No.
10/14/87

RECORDS OF DECISION (RODs) SIGNED TO DATE
* - Enforcement-lead, Regional Administrator-approved ROD
** - Regional Administrator-approved ROD
*** - Action Memorandum

Region	Site Name, State	Date Signed By AA/OSWER
** Fiscal Year 87		
1	Davies Liquid, RI	09/29/87**
1	Ottati & Goss, NH	01/16/87*
1	Re-Solve, MA (SUBSEQUENT)	09/23/87**
2	Chemical Control, NJ (SUBSEQUENT)	09/23/87**
2	Cooper Road, NJ	09/29/87**
2	Diamond Alkali, NJ	09/30/87*
2	Endicott Village, NY	09/25/87**
2	GE Moreau, NY	07/13/87*
2	Haviland Complex, NY	09/30/87**
2	Katonah Well, NY	09/25/87**
2	Montgomery TWP, NJ	09/29/87**
2	Renora, NJ	09/30/87*
2	South Brunswick, NJ	09/30/87*
2	Suffern Well Field, NY	09/25/87**
2	Vega Alta, PR	09/30/87*
2	Volney, NY	07/31/87**
2	Waldick Aerospace, NJ	09/29/87**
2	Williams Property, NJ	09/30/87**
3	Kane & Lombard, MD	09/30/87**
3	Palmerton Zinc, PA	09/04/87*
3	Presque Isle, PA	09/30/87*
3	Saltville Waste, VA	06/30/87*
3	West Virginia Ordnance, WV	03/31/87*
4	Geiger/C & M Oil, SC	06/01/87*
4	Gold Coast, FL	09/11/87*
4	Independent Nail, SC	09/30/87**
4	NW 58th Street, FL	09/21/87*
4	Newport Dump, KY	03/27/87*
4	Palmetto Wood, SC	09/30/87**
4	Parramore Surplus, FL	09/15/87**
4	Powersville Landfill, GA	09/30/87*
4	Sodeyco, NC	09/24/87*
4	Tower Chemical, FL	06/30/87**
4	Tri-City Conservation, FL (NO ACTION)	09/11/87*
5	FMC Corp., MN	09/30/87*
5	Industrial Excess, OH	09/30/87**

Note: The Superfund Amendments (SARA) were signed 10/17/86 with a 30-day grandfather period. Some of these Records of Decision (RODs) may be considered pre SARA.

RECORDS OF DECISION (RODs) SIGNED TO DATE
* - Enforcement-lead, Regional Administrator-approved ROD
** - Regional Administrator-approved ROD
*** - Action Memorandum

Region	Site Name, State	Date Signed By AA/OSWER
5	Johns-Manville, IL	06/30/87*
5	Laskin/Poplar, OH (SUBSEQUENT)	09/30/87**
5	Liquid Disposal, MI	09/30/87**
5	Marion Bragg, IN	09/30/87**
5	New Brighton, MN (SUBSEQUENT)	03/31/87**
5	Northern Engraving, WI	09/29/87*
5	Northside/Envirochem, IN	09/25/87*
5	Rose Township, MI	09/30/87**
5	Schmalz Dump, WI (SUBSEQUENT)	09/30/87**
5	Seymour Recycling, IN (SUBSEQUENT)	09/04/87*
6	Bayou Bonfouca, LA (SUBSEQUENT)	03/31/87**
6	* Bayou Sorrel, LA	11/14/86*
6	Cleve Reber, LA	03/31/87**
6	Compass Industries, OK	09/29/87**
6	Crystal City Airport, TX	09/29/87**
6	* ~~* Gurley Pit, AR~~	~~10/06/86*~~
6	* Hardage/Criner, OK	11/14/86*
6	Highland Acid Pits, TX (SUBSEQUENT)	06/26/87**
6	* Mid-South, AR	11/14/86*
6	Petro Chem, TX	03/27/87**
6	Sand Springs, OK	09/29/87*
7	Conservation Chemical, MO	09/30/87*
7	Minker Stout/Romaine, MO (SUBSEQUENT)	09/28/87**
7	Minker Stout/Stout, MO (SUBSEQUENT)	09/28/87**
8	Central City/Clear Creek, CO	09/30/87**
8	Denver Radium I, CO (SUBSEQUENT)	09/30/87**
8	Denver Radium II, CO (SUBSEQUENT)	09/30/87**
8	Denver Radium III, CO (SUBSEQUENT)	09/30/87**
8	Denver Radium/Card Property, CO (SUBSEQUENT)	06/30/87**
8	Denver Radium/Open Space Prop., CO (SUBSEQUENT)	09/30/87**
8	Rocky Mountain Arsenal, CO	06/04/87*
9	Litchfield Airport, AZ	09/29/87*
9	Operating Industries, CA	07/31/87*
9	San Fernando Valley, CA	09/24/87**
9	San Gabriel, CA (SUBSEQUENT)	09/30/87**
9	Stringfellow Acid Pits, CA (SUBSEQUENT)	06/25/87**
10	Colbert Landfill, WA	09/29/87**

Post-SARA Enforcement Record of Decisions

Region	Site Name	State	Date
I	Ottati & Goss	NH	1/16/87
	Keefe Env. Services	NH	3/21/88*
II	Diamond Shamrock	NJ	9/30/87
	BFI-South Brunswick	NJ	9/30/87
	Vega Alta	PR	9/29/87
	Renora	NJ	9/29/87
	GE Moreau	NY	7/13/87
	Old Bethpage	NY	3/17/88
III	New Castle Steel	DE	3/31/88
	Palmerton Zinc	PA	9/04/87
	Presque Isle	PA	9/30/87
	Middletown	PA	12/31/87
	Chisman Creek	VA	3/31/88*
	Saltville Waste	VA	6/30/87
	Ordanance Works	WV	3/31/88
	WV Ordinance	WV	3/27/87
IV	Geiger/C&M Oil	SC	6/01/87
	Gold Coast	FL	9/11/87
	NW 58th Street	FL	9/21/87
	Tri-City	FL	9/21/87
	Newport Dump	KY	3/27/87
	Powersville	GA	9/30/87
	Sodeyco	NC	9/24/87
	Celenese Corp.	NC	3/28/88
	Chemtronics	NC	4/1/88
V	Johns-Manville	IL	6/30/87
	Envirochem	IN	9/29/87
	Seymour Recycling	IN	9/25/87*
	Northside Lf	IN	9/29/87
	New Brighton/TCAAP	MN	9/25/87*
	FMC	MN	9/30/87
	Waste Disposal	MN	12/31/87
	Northern Engraving	WI	9/29/87
VI	Mid-South Wood	AR	11/14/86
	Gurley Pit	AR	10/06/86
	Bayou Sorrel	LA	11/14/86
	Hardage/Criner	OK	11/14/86
	Dixie Oil	TX	3/31/88
	Brio-Refining	TX	3/31/88
VII	Conservation Chem	MO	9/30/87

VIII	Rocky Mt. Arsenal	CO	6/04/87
	California Gulch	CO	3/29/88
	Anaconda Smelter	MT	10/2/87
IX	Operating Industries	CA	7/31/87
	Operating Industries	CA	11/16/87*
	Lithcfield Airport	AZ	9/29/87
X	Commencement Bay/	WA	
	Nearshore/Tideflats		12/30/87
	Tacoma Landfill		3/31/88*
	Gould	OR	3/31/88

* - Subsequent ROD

4/88

NPL Delistings to Date

3/86: (final)

1. Enterprise Avenue, Philadelphia PA
2. Friedman Property, Upper Freehold NJ
3. Lehigh Electric and Engineering Co. Old Forge Borough, PA
4. Morris Arsenic Dump, Morris, MN
5. PCB Spills, 210 miles of roads in NC
6. PCB Warehouse, Saipan, N. Mariana Is.
7. PCB Wastes, Trust territory of PacificIs.
8. Taputimu Farm, Island of Tutuila, American Samoa

9/87: (intent)

9. Middletown Road Dump, Annapolis Md.
10. Harris (Farley St.) Houston TX
11. Mountain View Mobile Home Estates, Globe AZ

3/88: (intent)

12. Tri-City Oil Conservationist Corp. Temple Terrace FL
13. Varsol Spill Site, Miami, FL

Mr. **Oberstar**. Now I would like to invite our EPA witnesses back with the exception, of course, of Administrator Thomas. We have Mr. Porter and Mr. Longest and Mr. Cannon who have been very patient and very attentive to questions, responses, the analysis.

I think we have another witness here who was not present earlier.

MR. PORTER—RESUMED

Mr. **Porter**. I have Tom Devine with me, Mr. Chairman, who is my technology manager. Do you need to swear him in?

Mr. **Oberstar**. In accordance with the procedures of the committee, will you raise your right hand?

Witness sworn.

Mr. **Oberstar**. Thank you.

Now let's allow you to take it from the top and review the points raised by Dr. Hirschhorn, give you an opportunity to respond, and then I will have some specific questions that I would like to raise, and I'm sure other members of the subcommittee will have the same.

Mr. **Porter**. Do you want me to give kind of a general statement as to what my overall reaction was——

Mr. **Oberstar**. Yes.

Mr. **Porter** [continuing]. And so forth?

Mr. **Oberstar**. That's correct.

Mr. **Porter**. Okay. I put up one additional chart, Mr. Chairman. I would like to just quickly talk through this.

I think the testimony was very interesting. I think Dr. Hirschhorn made some excellent points and we'll take them very seriously.

Mr. **Oberstar**. Is that an informational chart or is that an eye test?

Mr. **Porter**. It's also in your book. You have a blue book there. It can double as an eye test, yes. It's that blue book, toward the end. It's about the third chart from the back, I think.

[Material follows:]

Superfund Since SARA

A Look at Superfund Progress
October 1986 Through
March 1988

UNITED STATES · ENVIRONMENTAL PROTECTION AGENCY

April 1988

Superfund Scorecard

• Superfund sites inventory	29,065
• Preliminary assessments	26,831
• Site inspections	8,703
• National priorities list	951

Site Work Since SARA

	Planned	Actual
• Preliminary assessments	5,209	6,081
• Site inspections	1,635	1,814
• RI / FS starts	185	156
• Records of decision	167	111
• Remedial design starts	128	70
• Remedial action starts	79	60
• NPL deletions	17	12
• Site completions	6	8
• Removals	275	350

Enforcement Since SARA

	Planned	Actual
• RI / FS settlements	50	68
– Value		($ 40 M)
• RD / RA settlements	44	32
– Value		($ 286 M)
• Cost recovery settlements		57
– Value		($ 49.1 M)
• Cost recovery referrals	55	52
– Value		($ 200 M)

Regulations, Policies, and Guidances

- National contingency plan revisions in final review
- Hazard ranking system revisions in final review
- Technical assistance grants published 3 / 18 / 88
- Key guidances
  - Selection of remedy
  - Applicable or relevant and appropriate requirements
  - Superfund project execution
  - Streamlining the settlement process
  - De minimis settlements
  - Mixed funding settlements
- Over 30 other guidances issued

Status of Title III

Emergency Planning

- 50 state commissions
- 3,500 local commissions
- List of extremely hazardous substances and threshold planning quantities published
- Technical guidance and NRT planning guidance published

Training and Emergency Systems Review

- $ 5 M to states for Title III training and education
- Emergency systems review: interim report completed

Community-Right-To-Know

- Final rule published
- Material safety data sheets to local commissions and fire departments
- Section 312 inventory submitted

Toxic Release Inventory

- Final rule published
- First report due 7 / 1 / 88

Leaking Underground Storage Tanks Trust Fund

- 46 cooperative agreements with states

- Adequate core program capabilities through grants:

– Corrective action	44 states / territories
– Enforcement	44 states / territories
– Cost recovery	29 states / territories

- Cleanups initiated at 2,547 sites

- 50 state-level cleanups using Lust Trust Fund dollars

- Technical standards and financial responsibility regulations proposed

Research and Development

- 21 demonstration projects

- Field work completed on 5 projects

- Technical support centers for engineering, monitoring, transport, and ecological risk assessment

- 9 research grants for measurement and monitoring methods

- 5 research grants for in-situ treatment

Superfund Selection of Remedy Criteria

- Compliance with applicable or relevant and appropriate requirements
- Reduction of toxicity, mobility, or volume
- Short-term effectiveness
- Long-term effectiveness and permanence
- Implementability
- Cost
- Community acceptance
- State acceptance
- Overall protection of human health and environment

Records of Decision – Since SARA

Treatment Technologies	
• Incineration / thermal	21
• Solidification	8
• Stabilization / neutralization	7
• Volatilization / aeration	4
• Soil washing / flushing	4
• Biodegradation	3
• Other	8
Containment	
• On-site containment	32
• Temporary storage	8
• Off-site disposal	3
Ground Water	
• Pump and treat	47
• Alternate water supply	16
No Further Action	9

Sample Records of Decision

Sites	Remedy (Cost)	Key Options (Cost)	
• Chemical Control, NJ	In-situ fixation ($ 7.4 M)	Soil washing On-site incineration Off-site incineration	($ 14.5 M) ($ 22.3 M) ($ 35.1 M)
• Compass Industries, OK	RCRA cap ($ 12 M)	Full incineration Partial incineration	($ 339 M) ($ 17 M)
• Crystal City Airp., TX	Consolidation w / RCRA cap ($ 1.6 M)	Soil flushing Incineration	($ 16.1 M) ($ 11.4 M)
• Pristine, OH	In-situ vitrification consolidation of sediments ($ 21.7 M)	Incineration	($ 51.5 M)
• Sand Springs, OK	Solidification / containment / partial incineration ($ 38 M)	On-site incineration Off-site incineration	($ 67 M) ($ 425 M)
• French Limited, TX	Biodegradation / stabilization ($ 47 M)	On-site incineration Off-site incineration w / stabilization	($ 120 M) ($ 75 M)
• Liquid Disposal, MI	Solidification / Slurry Wall / cap ($ 22.4 M)	On-site incineration In-situ biodegradation	($ 70 M) ($ 55.3 M)

Mr. **Porter**. I found the testimony very interesting and the questions very interesting. I believe, however, the problem is much, much broader than was alluded to. I would like to talk just a second about the real world of Superfund, not the academic world that we just heard from.

The real world of Superfund is a world where we have to consider many factors. In fact, the law talks about permanent remedies. It instructs us to use cost effectiveness. It isn't something we can just play around with. It instructs the President to select remedies which are cost-effective.

There were a number of things that were glossed over that I would like to direct your attention to. If you look at this chart, there are three things in particular that I find in the real world dealing with Congressmen, Congresswomen, and others, as well as mayors, city council people, and all others around the country that I run into over and over again. These are the three points about halfway down.

I just mentioned cost effectiveness, which is mandated in the law.

Community acceptance—we are directed in the law to present a proposed plan to the community. We are directed to get their comments and explain how we intend to deal with their comments with respect to a remedy.

State acceptance—the State is instructed to pay 10 percent of the remedy if, in fact, the fund finances the job. States don't always do that. One of the real lids on this program with respect to cost—and perhaps it is good—is that States frequently tell us, is for example, "I'm not interested in a $50 million incinerator. That's $5 million of my money. I don't think that's cost effective. I don't think we're getting any extra benefit for that incinerator." We have dialogue with States to this effect.

Those three points—cost effectiveness, community acceptance, and State acceptance—are the real world of Superfund, in addition to all the technical factors that we can discuss some more such as permanence and other kinds of things.

Let me tell you the other box we can get into on Superfund.

Mr. **Oberstar**. Before you go further, do you have a standard set of criteria determining cost effectiveness among sites and among technologies and among toxic substances to be cleaned up?

Mr. **Porter**. We don't, Mr. Chairman, not in that sense. The Superfund program is very site specific. I would like to provide some examples with a couple of real sites.

Mr. **Oberstar**. I wanted to add——

Mr. **Porter**. Yes.

Mr. **Oberstar** [continuing]. Dioxin, of course, is very different from——

Mr. **Porter**. That's correct.

Mr. **Oberstar** [continuing]. Treating lead or arsenic in a particular site. Go ahead.

Mr. **Porter**. Actually, if I can digress for just a second, the reason the National Contingency Plan, our key rule, is late is that we spent about a year debating these factors.

There have been two groups at EPA and the rest of the world: the prescriptive group and the nonprescriptive group. Lee Thomas and I have tended to be in the nonprescriptive group; a lot of the rest of EPA and the rest of the world have been in the prescriptive group.

We have had honest debate for almost a year as we have worked real projects: do we need to tell people in cookbook fashion what cost effectiveness means exactly; what does permanence mean exactly, et cetera.

In addition, after you have done that, do we need to say how do they all relate to each other? Is permanence twice as important as cost effectiveness or half as important? Is community acceptance one-third as important as State acceptance or two-thirds as important?

We have chosen not to do that. I would like to send you a memo sometime on how we have instructed people to make these decisions—but the Administrator and I have and I think with the acceptance now of the agency, is we have said to people, "This is a judgment call."

There are only 11 decisionmakers at EPA to make these calls, the 10 regional administrators and myself. They are very serious calls on what a record of decision is. We consider all of these factors.

The one instruction we have given them, the thing which absolutely cannot be compromised is protection of human health and the environment. You have to indicate you think this remedy has a preference for permanence, it is a preference for treatment, and it meets this other set of criteria to the best extent you can; it is cost effective, but the bottom line is that it simply has to protect human health and the environment.

I would be interested in your comments on that. Lee and I have not found a way to quantify that, to tell the regions and the States—remember the States are in this, too—here's exactly how to think about that.

Remember, we're laying these criteria and this somewhat complex law against an extreme variety of sites. One Superfund site is a 27-square-mile lead smelter out in the West. We could talk about what permanent means with respect to that in a minute. That would take more than the whole fund to permanently remediate that in all likelihood.

We have another site which is a pipe coming out of the mountains in Colorado from a 100-year-old mining operation that flows at 10 or 15 gallons a minute into perpetuity with low PH or slightly acidic water. That's also a Superfund site.

Rocky Mountain Arsenal, which is going to cost about a billion dollars to clean up in Colorado, is a Superfund site, and on and on and on.

I have been to 30 or 40 sites. Let me tell you, they are all different. The sites in her district are different than in your district. They are very different.

When you start trying to write a cookbook that says for Rocky Mountain Arsenal, for the lead smelter, for the French Limited site on the Gulf Coast, for a huge landfill in New Jersey, here's exactly the way to think about cost effectiveness or exactly the way to think about permanence, you can't get there, in my judgment. That's the bad news.

The good news is that I think we're making pretty good decisions. We certainly have room for improvement. I think what Joel has pointed out which we want to really work on is documentation. We don't do as good a job as we perhaps could do on documentation—of how did you get from point A to point B? What was your thought process? I've been pushing on that, too.

I think the decisions are generally good, but the documentation, the analysis could be better.

I guess that would be my opening statement, Mr. Chairman. It's a judgment process. I would be happy to debate real sites with you or discuss it with you.

[The following was received from Mr. Porter:]

ROD decisions are made by using a process that relies upon the collection of data to characterize the site, the development and evaluation of alternatives and finally the selection of the remedy. Each alternative is evaluated in the ROD based on nine criteria:

Protection afforded by the remedy
Ability to meet or exceed ARARs
Long-term effectiveness (or permanence)
Short-term effectiveness (impacts during implementation)
Reduction of mobility, toxicity or volume of waste through treatment
Ability to implement the remedy
Cost (both for implementation and long-term, costs)
Community acceptance
State acceptance

After documenting that each remedy is protective and meets its ARARs, a remedy is selected by showing how the remedy represernts the best balance of long-term and short-term effectiveness, reduction of mobility, toxicity or volume of waste, implementability and cost. The ROD also indicates state and community acceptance and how their key comments were factored into the decision.

The ROD, along with the remedial investigation and feasibility study and other relevant site data become part of the administrative record.

Mr. PORTER. I would agree with Congresswoman Johnson—it's been an enormous help to me to have some of these schedules. We had six sites cleaned up in the first five years. You remember those days. By aiming for 175 remedial actions in three years, we have forced people to make decisions. These are not easy decisions. The natural reaction to me, the regional administrators, and everybody else is: could we have more data, could we wait longer? The reaction to the public to that has been: no, no. The biggest reaction I get from the public out there is: would you please get on with it?

Even if it's not the ultimate, ultimate that there can be no question about anything—we'll never get there. We want a good remedy. We want a solid remedy. We want you to get on with it.

There is a tension there, as Lee indicated, a real tension between impeccable work at every site and doing a lot of sites.

I guess this is fresh in my memory, but in the Appropriations Committee Mr. Boland and Senator Proxmire lectured us quite a bit recently about getting more bang for the buck, not spending all your money on two or three sites, et cetera, et cetera.

There is a real tension here. I guess what we are trying to do is drive down the middle to deal with good remedies, thoughtful remedies, well-thought-out remedies. We've got room to go on that; no question, but do a lot of them.

The Superfund breaks down right now to about $900 million a year of the $1.5 billion for actual construction. That would be about nine incinerators in the country. If I said permanent means incineration, let's do nine this year. We're not doing nine; we're working on 640 sites right now. They're not all in construction. About 400 are in engineering, some are in design, some are in construction. We're working on over 600 sites. So it's a pretty broad-based program.

I found the discussion, while I thought it was interesting and I think we need to work together, I also found it fair academic from what I see in the real world.

Mr. **Oberstar**. Now the law in section 121 says, "The President shall select appropriate remedial actions * * *" It goes on, "* * * and to the extent practicable which provide for cost-effective response."

Next sentence: "In evaluating cost effectiveness of proposed alternative remedial action, the President shall take into account total short- and long-term costs of such actions, including the cost of operation and maintenance for the entire period during which such activities will be required."

Now, on the one hand, you face a kind of Hobson's choice. If you do all the analysis that is suggested by that language, it might take a very long time to decide which course of action to follow, in which case you would be criticized by someone for having taken so much time. If you don't do that analysis, the cost-conscious folk who look things over, whether in OMB or in the Congress, say you've jumped too fast and spent too much money unwisely; you spent it on nine sites instead of 640.

I understand that's a real world consideration. I think what Dr. Hirschhorn was saying was not an academic exercise, but I think he's pointing out some problems here.

What we are looking for is not so much what you specifically did or did not do, but is there a system in place against which to measure performance? There is no question of motive or willingness to attack the problem, either, I think, on the part of OTA because I have had a number of discussions with them. There is a recognition of good will. There are shortcomings and problems that we want to deal with, and there is no question on our part that there is a lack of will or willingness to attack this job and get on with it and get underway with it.

What we want to see is performance. Is there a pattern developing here that will create some problems for the future?

Discuss briefly, just very concisely, how you do this cost-effective, short-term, long-term evaluation that the law says that Congress wants you to do. Those words just didn't come filtering out of the air. They were hammered out in conference and long discussions. Each word represents either a very deliberate purpose or a compromise of opinions.

Mr. **Porter**. Certainly, Mr. Chairman, and I agree with those words. I think they are very good words because it is very foolish from engineering or any other standpoint to only look at the immediate cost and not the long-term cost and the long-term operation and maintenance.

We instruct our regions to look at all the costs, capital and operating, operating meaning the ongoing costs. If we tell them, to use a fancy word, to normalize, that is put on the same basis the various remedies. We relate it to present worth or some other criterion where you're saying here's a project which would cost $100 million today, but then you would be through with any other costs. Here's another project which would cost $10 million today but would have a million dollars a year in perpetuity.

We get all those on the same basis. The important thing is usually present worth is what we do in backing them up. We say, What is the real cost of all those things on the same basis?

We then use that cost to compare remedies. Mr. Hirschhorn made a very good point which is about comparable remedies. You have a tradeoff here. If you have a $10 million remedy and a $100 million remedy and the $100 million remedy has very little, if any, perceptible gain, you could probably already have some gain. The States point out to us over and over again through their 10 percent share that they don't see much difference between the $10 million and the $100 million because it's their money.

Determining if they are comparable, is where the judgment comes in, because if we tell states the remedies have to be identical, then identical means incinerator A and incinerator B, landfill A and landfill B. These remedies are not identical, but they can be made comparable.

So we say take your comparable remedies or effective remedies, words to that effect; compare the net present value of the remedies and then take other inputs. You may not be finished because you may have a community that says, look, we don't want an incinerator; we absolutely plead with you; we would much prefer option B. We don't just take a vote, but we do listen to that. We may have a State that says the kinds of things I mentioned.

We put all that in our memory bank. Usually the memory bank is the brain of the regional administrator worked up through the various chains of command, the various experienced people reviewing it, and he or she then makes the final call based on several points: "I think the best remedy on the overall balance of things is the following."

Mr. **Oberstar**. Fine. Proceed.

Mr. **Porter**. Okay. Well, that's really all I wanted to say on that.

Mr. **Oberstar**. Well, go on to the next points.

Mr. **Porter**. I'm sorry, did you have another point in terms of a question?

Mr. **Oberstar**. No, no. I wanted you to go through—Mr. Clinger, do you have any questions on this particular issue?

Mr. **Clinger**. No, Mr. Chairman.

Mr. **Oberstar**. Okay. I want you to proceed through the other points that Mr. Hirschhorn raised.

Mr. **Porter**. Okay. I don't have explicit notes here on what he discussed. I wasn't going to try to comment on all parts of his testimony, but let me just hit a couple of other points.

First off, I do want to make clear that perhaps the word "academic" was an unfortunate use of terms. I don't mean what he is doing is academic. I think it's very helpful. What I mean to imply is that I think he and his investigators take a broad view of the problem the way we do. We have to consider these other factors; the law tells us to. It's not just a technical exercise.

I guess my reaction to the study, from what I have seen of it so far, the technical part—unless you want to tell us that you've only instructed to look at the technical part, but what we find in the real world is that we have to consider these other factors.

One of the points he made that I thought was a good one actually that I would associate myself with, and there was some dialogue with Mrs. Johnson on this, is narrowing down of alternatives. We do believe that time could be saved on the studies and we're trying to get people to apply more judgment upfront and trying to get our experienced people in looking over some of the remedies so we can narrow down alternatives.

I believe—and I have done a lot of this kind of work, I guess, in prior lives—that a good study is usually an expeditious study. I don't personally see—it doesn't mean a break-neck study, but I mean an expeditious study.

I think the thing that I would disagree with Joel a little bit on the time frame. I was given four examples just this morning of projects in one of our regions that will all come in under 18 months in terms of the RIFS study.

I have not told the regions that there is anything magic about 18, that everything has to be done in 18 months, but I have said these studies, as he pointed out, have taken sometimes three and four years. The community is not excited about that. I don't think we necessarily get a better answer because we take it three or four years.

We are trying to build in a little more bias for action. For example, if we see a project along the way which makes sense, we want to have the ability to do that project while we keep studying.

I think in terms of what he said, I would disagree with him a little bit, but agree, on the other hand, that there are things we can do to shorten the study frame.

The other thing he said toward the end there I want to comment on maybe a little bit. I find myself again kind in the horns of a dilemma. On the one hand, he seems to be saying we need to be out there finding thousands of more sites and not eliminating any arbitrarily, but you're going too fast with respect to the 175. I'm not quite clear what that means.

Again, we're trying to play it down the middle. We are looking at about 3,000 sites a year in our preliminary assessment program. We are trying to front-end load those through the States in the sense of the worst sites first.

An important philosophical point, which relates to something you discussed with him, is we're not trying to prove a negative in these preliminary assessments. We are not trying to say we have quickly looked at 3,000 sites this year and with a $5 or $10 or $15 thousand effort on each one of those; we have prove there will never be a problem.

We come at it the other way. We say: is there an apparent serious problem at this site? If there is an apparent serious problem at that site, it moves to the next stage.

It doesn't mean there is no problem necessarily. If it does not appear to be a serious problem, we may come back to it later. The States have Superfund programs. Your State has a very good one as other States do. The State of New York has 1800 sites right now in their program.

So it isn't like, as Lee Thomas pointed out, we're the only show in town, but we are not arbitrarily or bureaucratically trying to limit the sites. What we are doing, though, is saying there is some limit to what we can handle, but we're about there.

I think you pointed out, if anything, we're perhaps moving too quickly and maybe not deliberately enough. We think the 175 is a very tough goal. We don't see any point in putting more sites in the queue, particularly if they don't appear to be bad sites, to feed into a system which will take four or five years before we get to them. We'd rather try to deal with them under RCRA or have a State program deal with them or have the underground storage tank program deal with them, or on and on and on.

I think that's a philosophical point that perhaps needs some discussion.

As far as technology, I might make just one comment on this comments. We agree that technology is evolving quickly. We agree that we want to take full advantage of this technology. We do want to look carefully at costs.

I think we do have people who look very carefully at costs. We have professional engineering firms we hire. They do the cost estimates. They are very experienced companies. I'm not saying they are always right because this is, again, not an exact science, but they work very hard on the costs.

Mr. OBERSTAR. Do you have an updated cost manual for distribution to the regions and to the field offices?

Mr. PORTER. We don't have a cost manual per se; we have various guidances on the costs.

Mr. OBERSTAR. Are those up to date?

Mr. PORTER. I think you could say that, yes. I'm not quite sure what you are getting at in the sense of——

Mr. OBERSTAR. Well, what I understand is that the guidance provided to the regions, the current manual has not been updated in the last five years.

Mr. PORTER. Mr. Chairman, if I understand your question, one of the things we have not done or not seen the relevance of doing, if you mean a cost manual in the sense that we have kind of unit costs for a lot of things in the manual and you turn to it and you say incineration at Times Beach will cost a certain amount or incineration at Love Canal will cost another amount—for a couple of reasons we haven't done that.

One is that the technology is evolving very quickly. No. 2, we task our engineers on the site, our contractors, to look at those costs in the context of that problem. We just find the accuracy to get it out of a manual would be so far from reality that we don't see the need to do that.

Mr. OBERSTAR. Any further comments that you would like to make?

Mr. PORTER. No, I don't think so.

Mr. OBERSTAR. All right. I would like to pick up with perhaps the last point of Mr. Hirschhorn's analysis, and that is the workforce both in Government and industry. Superfund has in seven or eight years gone from a program of a few hundred thousand dollars in value to several billion, and now potentially $8.5 billion as provided in the SARA amendments. There has had to be an enormous jump in workforce to accommodate that increase in cost and in scope of program.

The OTA analysis is that there are inexperienced personnel, both in the EPA and, understandably, in the industry that is charged with the responsibility in many cases under contract for the actual cleanup.

What training programs, what preparation is there? There isn't even an academic program for Superfund. I don't think you can go to a college and take a course in Superfund, but there are other professional preparations for the work of Superfund.

How is EPA going about its personnel selection? What are you doing for in-service training? What are you asking of contractors?

In a program of this kind where much is being contracted out there may be almost an inherent in-house bias in favor of industry as having superior preparation to that of Government personnel, which may not, in fact, be the case.

Mr. PORTER. Mr. Chairman, those are all good points. We're certainly concerned about that.

There are 2750 people in the Superfund program at EPA at last count and thousands more, as Dr. Hirschhorn indicated, in the private contractors.

I would say two things. Working sort of backwards from the contractors, there are a lot of very experienced engineering companies in this country, some of which have been in business 70 or 80 years. We are trying to get more competition among those firms so that it is not to their advantage to put junior people on the projects. We want their senior people involved. I've recently written a letter to the contractors saying we want your senior people involved in these tough decisions.

We've gone to a system of having more contracts, more ability for the region to choose between contractors. Frankly, the people who are doing good work get more work; the people who don't do good work will get less work. That doesn't solve all the problems, but I think we have a lot of people who want to work in this program; that is, a lot of engineering firms, and we're going to demand excellent performance from them.

With respect to EPA employees——

Mr. OBERSTAR. Let me interrupt you there.

Mr. PORTER. Sure.

Mr. OBERSTAR. I have taken the time to meet with some of the contractor firms, and I'll not mention them by name. I was amazed to find as I went around their top management personnel to find maybe five months, six months— a year was a long time in many cases.

They had been with this firm and with this technology, and you go down the ranks and they're hiring at such a great rate that they have very little institutional experience. They may have a targeted background in chemistry or in physics or in, on a practical level, actual management of waste, but not a real depth of experience, I found.

Mr. PORTER. Mr. Chairman, I think there is some of that. There are people who have gotten into this business rapidly as other lines of work have phased down. But, generally speaking, I think the contractors we're using are experienced firms. There are some new people as they have hired people. They have had to ramp up.

One thing I have been trying to do is to spread the wealth. One of the things we did I guess three or four years ago, we tended to give a lot of work to relatively few companies. I think we really did stretch these companies. I think they worked hard. They generally did good work, but we would have a company that might be doing 100 engineering studies for us, one company doing a hundred. I have tried to cut that back and say, look, let's have 20 or 30 companies doing work for us. I want to be sure they have good project managers assigned and all that.

I think we are going through a curve there where we're trying to phase out of a system which had perhaps too much work being done by too few companies to one where we are having people take on a reasonable amount of work.

I don't disagree that there is a problem with new people because these people are hiring from each other. It's a very competitive game.

As Lee indicated, the Department of Defense and others have big cleanup programs. We're not even the only show in town.

But I think on that end the competition is going to solve some of that because we are going to be much tougher, and are starting to be much tougher, in the sense of telling people, look, you've simply got to help us move this project; you've got to help us make good decisions, because that helps us with the other part of the problem which is undoubtedly we have a lot of fairly junior people at the lower levels of the agency that are fairly new, who may not stay too long, that are working on these projects.

As Lee also indicated, though, as you get up to the first line managers and the branch chiefs and the office directors, and on and on, those tend to be career people. All of my Waste Division directors—and I have 10 of them, one in each region, running RCRA and Superfund—they were all here when I got here three years ago. They have all been with EPA, I would say, on the order of 10 to 15 years. They are very seasoned, professional people. The Superfund branch chiefs tend to have been in the agency quite a while.

Our Achilles' heel—and you're right about it— is the first line managers and the first line people. We try to do a couple of things. One, and we can go into more detail with Mr. Longest on this, if you like, but we do have a certificate program now for a project manager, a Superfund project manager. You take a series of courses; and you get a sheepskin to put on the wall. It's a formal training program that you become a Superfund project manager.

We've also changed our personnel procedures so that a project manager can get a grade raise above various levels. One thing we discovered a few years ago is that project managers in the bureaucratic context of the Government were not being called supervisors. Therefore, they stopped at the GS-12 level. We've made that where they can get—in fact, the project manager at Love Canal is a GS-15 or has been because we have said we want to have the ability on these tough projects to assign a more serious, a more senior person to this project. So we have raised the pay scales, the upper limits, in terms of the project managers.

We are having periodic sessions around the country, training sessions very frequently with ourselves and contractors. We would be happy to submit more of this in writing, but we have quite a lot going on. I don't want to kid you, though, I don't have an answer for the basic problem I guess, which is our people tend to be popular with consulting firms. I have not thought of a way to chain them to their desks. People move in this society between jobs. They tend to stay if they've stayed a few years. We're going to work harder on keeping them that critical two or three years where they tend to stay a while.

Mr. **Oberstar**. That's clearly a problem, and the problem is one of pay basically. We're trying to deal with that in the FAA to make it attractive for personnel not only to stay, but to accept promotions within the agency, recognizing different costs of living across the country. I can appreciate your having that problem in EPA.

Mr. Longest, I can't resist asking a question about the construction grants program. Does that have any guidance and certification program such as Mr. Porter just referred to for the Superfund program?

Mr. **Longest**. We did not specifically have a guidance or a certificate program. Construction grants had one advantage. There were many years of experience out there in the waste water treatment field.

You referred to the fact that there is no college course on Superfund. There was a college course, and there still is in fact, on waste water treatment. There was a good cadre of people in the field when we got into the waste water treatment business back heavily in 1972.

We're dealing in an area where people come from many fields, whether we're talking about chemists, biologists, chemical engineers, civil engineers, sanitary engineers, et cetera, and they have never been all amalgamated together into a specific career field to deal specifically with Superfund. That's why we have so much training that we have to go through, because we have to cross-train many different people from many different walks of life to come up with what we call a Superfund person who can deal with all of these issues.

As Dr. Porter said, we were following up on a recommendation from Senator Lautenberg's oversight hearing that we do something to keep people. We are moving along working with Tom Devine, to my left here, who heads up our technology and training areas, to develop a curriculum—the courses are there, but a curriculum for young project officers to come in and take and give them an inducement to stay and to learn by taking certain courses and getting a certificate, and hopefully they will spend more time in the program before they leave.

Mr. **Oberstar**. I certainly encourage you to pursue that course of action and continue to intensify it and make it attractive for people to remain in Government with a high degree of esprit de corps, which has always characterized the EPA except for a very brief, painful period.

At this point the Chair would like to defer to the gentleman from Pennsylvania. I was sort of expecting him to jump in at points and ask questions. Please go ahead.

Mr. CLINGER. Thank you very much, Mr. Chairman.

I think this has been a very interesting day all the way around.

Just following up on our colleague, Mrs. Johnson, and her discussion with Dr. Hirschhorn earlier, and that is, are we raising expectations too high? In other words, we've got an enormous problem and, as has been said over and over today, it's going to take a long time. We're talking about many, many years before we will reach the end of this road.

We've got a program in place. We've appropriated money. We've got EPA out there diligently looking at these things.

But have we raised expectations to the point where people are going to expect more than you are able really to produce in the short term?

Mr. PORTER. Mr. Clinger, I think there is some danger of that. I think that the program is going reasonably well now. We've got some areas we need to improve in.

I think, though, that one of the problems is that if we raise the expectations of people that we somehow will do such permanent remedies, meaning that we will destroy every contaminant at every site, that cannot be done for $8.5 billion.

Mr. CLINGER. I have a question of whether we are not at least holding out, implying that that is going to be the ultimate result—that we are going in every case to apply the optimum solution to the problem and clearly eliminate any potential threat now or in the future at those sites. I think that that is really unrealistic. We're never going to be able to reach that degree of eradication of these things.

Mr. PORTER. Mr. Clinger, one of the interesting things as you work these sites out there, you find that, as I have said a couple of times, sometimes the most expansive remedy or the most expensive remedy is also a disruptive remedy.

For example, it maybe involves a lot of activity at a site in terms of incineration or trucks carrying things to the incinerator for many years. We frequently find that is not popular, and people tend to want to know what additional benefit they are going to get for that.

I don't mean to imply we can't get good remedies. I think we can get excellent remedies. I'm just wondering if that last increment that may be extremely expensive is where we may raise expectations too much.

Mr. CLINGER. If, for example, the only criterion you had to consider was the remedy that was going to result in reduction of toxicity, mobility, or volume—in other words, if that was your only standard and cost was not a factor or community acceptance was not a factor—presumably, you could come up with an optimum solution to any given problem. Cost would not be a consideration. What the community thought of it would not be a consideration, but you would have the optimum solution.

What you are saying is that you can't do that because you have the other factors to consider. Therefore, oftentimes you don't achieve the optimum solution.

Mr. PORTER. I think that is right. I think we do the best we can. I don't want to leave the impression for a minute that we can't have very good remedies. I think we can.

There are two problems with the ultimate, if you can use that term, whatever that turns out to be. First, it may take a very long time to implement, and that's a tradeoff. We talk about short-term effectiveness and long-term effectiveness.

But I get pressure every day from people who want us to move on these sites. They want the site cleaned up. Again, the law instructs us to come back every five years if we leave any contamination on the site. There's a built-in requirement that if you are not sure you have done everything you may have to do, you have to revisit it.

I think I could even associate myself with Mr. Hirschhorn's comment about permanence being something where you don't have to keep redoing the treatment or redoing the remedy. I think that's probably wise.

When we put a cap on or when we put monitoring wells in or we do in situ solidification or various other things, we do it with the understanding that we hope that will work permanently, not in geologic time, as somebody indicated, but for some finite time period we expect that to work.

Mr. CLINGER. Mr. Porter, Dr. Hirschhorn said permanence should be something that was either destruction of what's there or conversion of it into some inert or harmless substance. How do you view things like vitrification, separation, that sort of thing? Do you view that as permanent?

Mr. PORTER. Well, I think it can be. I think he also said—and, again, I would agree with this—that you have two kinds of contaminants here. You have organics which can be biodegraded or burned into carbon dioxide and water and other more benign things, and you also have metals. Metals don't go anywhere.

If you have copper or lead, or cadmium, that's going to be there. Are you going to solidify it right there in some dilute fashion and try to keep it in that matrix? Are you going to dig it up? If you run it through an incinerator, it will be in the ash in the incinerator because it hasn't gone anywhere. If you take it to another landfill, you've still got to deal with it.

I think that what we are often trying to do with solidification and those kinds of things is deal with things such as metals which cannot be degraded other ways.

On the other hand, as he indicated also, occasionally we want to deal with organics because they may be in very dilute form or some of the other criteria may be important. For example, some of the sites he mentioned the State strongly preferred what we ended up doing. We didn't, again, just take a vote.

Let me tell you the worst result in Superfund, and that is if I get in a bind where the State won't pay the 10 percent—that means we can't move ahead with the fund—nor will PRP's agree to do it. That's what we call a shelf remedy. It just sits on the shelf.

I've got to deal with one or the other. It doesn't mean the PRP's or the responsible parties are going to select the remedy, but I've either got to work with something I can force them to do or I've got to do something the State will attempt so they will pay the 10 percent and we can move ahead.

There are some real tensions here between those three parties.

Mr. **Clinger**. It seems to me that one theme, one clear indication I'm getting is that the days of landfills, whether it's for solid waste disposal, hazardous waste disposal, or whatever, are over, and that we're moving toward a time when that is not going to be an available option for any kind of disposal.

In view of the fact that Dr. Hirschhorn indicated that by his studies about 42 percent of your solutions are landfill solutions, what kind of thinking are you giving to down the road, to the future, when that is just not going to be available to you as an option?

Mr. **Porter**. Two comments, Mr. Clinger: one, I understand what the law says, and someone repeated it today—that the least preferred option is to take something offsite without treatment. We understand that. We preach that every day.

It doesn't mean you never do it because you may be in a situation where you for at least part of the solution have to do that. We understand that.

The second thing is that some things will have to be on the land, either at the site or elsewhere, such as metals which are recycled. We are interested in recycling where we can.

The third point I would make, I guess, is that these remedies tend to involve combinations. One hundred and eighty sites on the National Priority List are municipal landfills or form municipal landfills. They tend to be huge areas.

There is no way within the money we've got, anyway, that we can somehow pick up all that landfill and "treat" it. We have to deal with some kind of containment or land disposal or something. We do want to treat the most concentrated and dangerous materials we can, but I don't want to kid you. At many of these big sites, Rocky Mountain Arsenal is another one where it would cost $2 or $3 billion to dig it all up and then it isn't at all clear where we would take it once we dug it up.

We do have some materials, and that's what I meant by combinations. The general approach we are taking now is to treat the principal threat, the concentrated threat, if we can possibly get our hands on it. Where we have a very dilute situation, a part per billion or a part per million in 40 acres, we don't see spending $100 million for that or $200 million, if we could convince ourselves that a cap with monitoring, with whatever, we can protect human health and the environment. That's very simplified, but we're tending to head toward treating principal threats, containing very, very dilute, innocuous materials.

Mr. **Clinger**. So what you're saying is that as landfills become less and less available as an option that you would move more toward treating in situ—in other words, with caps and——

Mr. **Porter**. Yes.

Mr. **Clinger** [continuing]. Containment on the site itself?

Mr. **Porter**. I guess another trend that we're seeing—and, again, it's partly driven by the law—we're tending to do a lot of onsite treatment for the simple fact, among others, the law does not require permits if you treat things on site. If you take it offsite, you must get a RCRA permit, which is a two- or three-year process.

I would say that we have a great difficulty in general in taking things elsewhere, particularly if it is anything new. By the way, a lot of things that we take offsite are taken to things like incinerators. They are not taken necessarily to landfills. They are taken to commercial incinerators where they are burned.

Mr. CLINGER. But, as you say, where you put a cap in or treat it in situ, that is not defined as a permanent solution for the problem. Does that imply that——

Mr. PORTER. I would say this, and maybe one way to look at this is that there are kind of degrees of permanence. As I said earlier today, certainly digging everything up and burning it is about as permanent as you can get. On the other hand, if you take just putting a cap over it and walking away, that's about as least permanent as you can get. Then there is a gradation.

We're tending, obviously, toward trying to do the more permanent treatment, but where we have very dilute materials over large areas, it's not going to be very cost effective, and perhaps will lead to other problems, to treat the material.

Certainly things like solidification, I would say, is not as permanent in the sense as some destructive techniques. If we take biological treatment and again we treat organics, we, in effect, destroy the organics or we turn them into CO2 and water.

Mr. CLINGER. Those that are not defined as being permanent solutions you are obligated by law to check on every 25 years?

Mr. PORTER. Every five.

Mr. CLINGER. Every five years.

Mr. PORTER. That's right. As a matter of fact, we're not sure how to interpret that just yet, but at virtually every site we leave at least one molecule of contamination on the site. The law says if you leave contamination on site, you need to revisit every five years. I think many of these sites will need ongoing checking.

Mr. CLINGER. It would be a pretty large undertaking, wouldn't it, because you're never really going to get rid of a lot of these sites? You're going to have to be constantly checking.

Mr. PORTER. I think that's going to be true.

Another thing we haven't talked much about today, but one of the remedies we choose a lot is pumping and treating groundwater. That looks like it's going to be a 5, 10, 15, 20, or more year process in many cases.

When we sign off on these sites and say they are cleaned up, one of the most important things to us with respect to the State particularly or the responsible parties is who is going to see after the site, who is going to maintain it, who is going to do the operation and maintenance, who is going to maintain the monitoring wells? We think these things will be around a while.

Mr. CLINGER. That has to be resolved before you walk away from it?

Mr. PORTER. That's correct.

Mr. CLINGER. Thank you very much.

Mr. OBERSTAR. I will also ask EPA to respond to a number of questions that Congressman Mineta would like to submit to Mr. Thomas. He was unable to remain for our hearing because he had another committee commitment of his own that he had to attend to.

[Questions and answers follow:]

I&O Subcommittee Hearing on Superfund Implementation

April 20, 1988

Questions Submitted for the Record

Norman Y. Mineta, M.C.

1. What is the status of our sites in Santa Clara County?

2. Is there a comprehensive, coordinated plan for the clean-up of the entire area?

3. What clean-up efforts are currently underway? If clean-up has not started, when will it begin and why has it not started?

4. What is the timetable for completion of the clean-up of Santa Clara County?

5. Is there a national policy to determine whether a site will be cleaned-up under Superfund, RCRA, private negotiation with the responsible parties, or State laws and clean-up programs?

6. How do you coordinate clean-up efforts that are fragmented between different Federal and State laws? Is there someone or some agency in charge to oversee and coordinate these fragmented efforts?

7. Given that environmental pollution is not constrained to stay within the boundaries of any political jurisdiction, will this fragmented, piecemeal approach solve the problem?

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

JUN 24 1988

Honorable Norman Y. Mineta
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Mineta:

Enclosed are responses to your follow-up questions from the April 20, 1988 hearing before the Public Works and Transportation Subcommittee on Investigations and Oversight. I have also submitted these to the subcommittee.

Thank you for your interest. If you have any questions please contact me.

Sincerely,

Win Porter

J. Winston Porter

I&O SUBCOMMITTEE HEARING ON SUPERFUND IMPLEMENTATION

Question: What is the status of the sites in Santa Clara County?

Answer: Since 1980, groundwater and/or soil contamination has resulted from toxic organic solvent releases from more than 100 industrial sites in the Santa Clara Valley. Contamination has been largely attributed to the high tech industries prevalent in the South San Francisco Bay area. The chemicals commonly detected were: trichloromethane (TCA), trichloroethylene (TCE), tetrachloroethylene (PCE), dichloroethanes (DCA), methylene chloride, freons, and chlorinated benzenes.

Currently, 19 of these sites are proposed or on the final Superfund National Priorities List (NPL). Responsible parties have generally assumed the role of investigating and remediating the contamination problems under the oversight of either the California Regional Water Quality Control Board (RWQCB), California Department of Health Services (DHS), or EPA. Aside from the Lorentz Barrel and Drum site, a federally-funded site, all sites are under enforcement orders to compel the necessary investigation and cleanup. The RWQCB has lead oversight responsibilities for 12 sites, DHS has the lead for 2 sites, and EPA has the lead for 5 sites.

Various cleanup initiatives are presently ongoing to prevent the spread of contamination emanating from these sites. Groundwater extraction and treatment systems are either planned or in place at virtually all NPL sites in Santa Clara County. The only exception is the Westinghouse site in Sunnyvale where EPA has recently taken over the lead from RWQCB and is currently negotiating a consent agreement with the responsible parties to continue the RI/FS.

Question: Is there a comprehensive, coordinated plan for the clean-up of the entire area?

Answer: Historically, the RWQCB has maintained lead responsibility for clean-up of the South Bay sites. However, several government agencies were concerned with the ground water problem in the South Bay. To better coordinate intergovernmental response as well as to avoid gaps and duplication of effort, the South Bay Ground Water Contamination Task Force was formed. EPA co-chairs this group with Santa Clara County. Representatives from DHS, local agencies, local industry and the community actively participate in Quarterly Task Force meetings.

// EPA has previously entered into a multi-site cooperative agreement (MSCA) to support and supplement RWQCB resources. To better utilize enforcement tools available through state and federal law, an Enforcement Agreement was established between EPA, DHS, and SWRCB/RWQCB. In December 1987, EPA Region 9 formed a single section within the Superfund Program to focus and better coordinate efforts for a NPL sites in the South Bay. EPA has recently awarded an additional $1 million for the MSCA to support the State's significant role in oversight of responsible party clean-ups at South Bay sites. EPA has the sole lead and is continuing aggressive enforcement oversight at four sites in the South Bay, (Fairchild, Intel, Raytheon, Westinghouse) and is conducting a federally funded clean-up at one other (Lorentz Barrel and Drum).

Question: At what clean-up efforts are currently underway? If Clean-up has not started, when will it begin and why has it not started?

Answer: Through the collective efforts of Federal, State, and local agencies, in conjunction with private industry response, extensive investigation and clean-up efforts are underway at over 100 sites in the Santa Clara Valley. As previously mentioned, aside from the federally-funded Lorentz Barrel and Drum site, all NPL sites in this Region are under enforcement orders to conduct necessary investigative and remedial cleanup activities.

Furthermore, to prevent the spread of contamination originating from these sites, groundwater extraction and treatment systems have been implemented or are planned at all NPL sites except for the Westinghouse site. However, previous remedial activities at this site have been performed by Westinghouse, under RWQCB oversite, to remove widespread surface contamination due to the presence of polychlorinated biphenyls (PCBs) in the soil. In December 1987, EPA assumed the lead for this site from RWQCB and is currently conducting negotiations with the responsible parties for completion of the RI/FS by 1989.

Significant clean-up has been accomplished at the NPL and non-NPL sites in this region as a result of EPA and State cooperative enforcement efforts along with responsible party participation. These cleanup accomplishments include:

- 8695 cubic yards of polluted soil removed
- 1479 monitoring wells installed
- 5 slurry walls installed at up to 140 ft. deep and totalling 3 miles long

- 14 soil gas extraction wells installed
- 13 tons per year of contaminants being extracted
- $91 million expended by responsible parties for investigation and clean-up

The results of previous and ongoing investigative and remedial activity have served to address immediate and potential health problems in the Santa Clara Valley. Currently, the groundwater contamination in the region is not an immediate health threat but is acknowledged to be a serious potential problem.

Question: What is the timetable for completion of the clean-up of Santa Clara County?

Answer: Well over 100 sites have been identified in the South Bay region as having potential groundwater contamination problems. The lateral and vertical extent of contamination has not been completely defined for many of these sites. A definitive estimate of when cleanup will be completed in the County can be made when the remedial investigations and feasibility studies at these sites are completed. For federal-lead or NPL sites, the remedial investigation and feasibility study (RI/FS) is complete when the Record of Decision (ROD) is signed. For State-lead sites, the completion of the RI/FS is attained when the Remedial Action Plan (RAP) is approved. In regard to the 19 NPL sites in the South Bay region, the current timetable for approval of a final ROD or RAP is:

* Fiscal year 1988: 1 approval
* Fiscal Year 1989: 9 approvals
* Fiscal Year 1990: 8 approvals

(These projections do not include the Moffett site, which is a federal facility).

Question: Is there a national policy to determine whether a site will be clean-up under Superfund, RCRA, Private negotiation with the responsible parties, or State laws and clean-up programs?

Answer: EPA does have or is in the process of developing several policies or initiatives which assist EPA in maximizing the number of potentially dangerous hazardous waste sites that can be addressed, so that EPA can direct its CERCLA efforts (and Fund monies if necessary) to those sites where clean-up cannot be achieved by other means. Also, EPA believes where other authorities are in place to achieve clean-up, it may be appropriate to defer to those authorities. EPA believes these policies and guidances will provide an objective and systematic means of determining whether a site should be addressed by CERCLA or other Federal or State authorities that have corrective action authority.

EPA's current deferral policy has been limited to sites that can be addressed by the corrective action authorities of RCRA Subtitle C or that are subject to regulation by the Nuclear Regulatory Commission (NRC). Currently, RCRA Subtitle C facilities are listed on the NPL only if necessary corrective actions under RCRA are unlikely to be performed (June 10, 1986, 51 FR 21054), or if certain criteria for listing are met. EPA's present policy for NRC licensed sites (September 8, 1983, 48 FR 40658), is not to list releases of source, by-product or special nuclear material from any NRC licensed facility on the grounds that the NRC has full authority to require clean-up of releases from such facilities.

Question: How do you coordinate clean-up efforts that are fragmented between different Federal and State laws? Is there someone or some agency in charge to oversee and coordinate these fragmented efforts?

Answer: Section 121(d) of CERCLA requires that applicable or relevant and appropriate requirements (ARARs) of Federal environmental laws and more stringent promulgated State ARARs be incorporated into remedies proposed and selected at National Priorities List sites. Therefore, Federal and State cleanup requirements (based on State laws and regulations) are examined on a site-by-site basis when conducting remedial studies. The requirements met by the remedy selected are described in the Record of Decision signed by EPA.

Subpart F of the proposed National Contingency Plan lays out a requirement for identifying and communicating State ARARs as part of the remedial response process. The Subpart also outlines various mechanisms for meeting this requirement. Specifically, the Subpart calls for development of a Superfund Memorandum of Agreement (SMOA), which lays out the roles and responsibilities of EPA and the State. The SMOA is developed in terms of each party acting in either a "lead" or "support" role. In the absence of a SMOA, the proposed NCP outlines minimum points in the remedial process where EPA and the State are to coordinate their activities.

From an implementation standpoint, each site has a designated Federal or State project manager responsible for coordinating the "lead" or "support" agency's responsibilities for the site.

Question: Given that environmental pollution is not constrained to stay within the boundaries of any political jurisdiction, will this fragmented, piecemeal approach solve the problem?

Answer: The current remedial and enforcement efforts underway in the Santa Clara Valley have effectively combined resources from private industry, State and Federal agencies. Although RWQCB maintains the lead oversight role for many of these sites, EPA has coordinated inter-agency efforts through the MSCA to ensure proper oversight of responsible party clean-ups. When necessary, EPA has been involved site specifically where PRPs have refused or have been unable to conduct remedial investigation and clean-ups. EPA believes that this current approach, utilizing the collective resources of private industry and the enforcement and oversight efforts of government regulatory authorities, will provide the flexibility to adequately address contamination that may migrate from one political jurisdiction to another.

Mr. OBERSTAR. Does the gentleman from Pennsylvania have further comments?

Mr. CLINGER. I have questions I would like to submit for the record.

Mr. OBERSTAR. Without objection, the questions of the gentleman from Pennsylvania will be submitted for further response.

[Questions and answers follow:]

QUESTIONS FOR LEE M.THOMAS, ADMINISTRATOR, EPA

Question 1: The 1986 amendments revised the statutory time and dollar limits regarding EPA's removal authority. The Act also expanded EPA's authority to waive the twelve month/$2 million limits if appropriate and consistent with later planned remedial work. How often have those limits been waived? What has been the average cost of removals where the waiver has been utilized?

Answer: EPA has used its expanded authority to waive the twelve month/$2 million limit 22 times since the 1986 amendments. The consistency waiver has been used 4 times. The average cost of all removals in FY'87 and FY'88 where the $2 million ceiling was exceeded is $4,007,745.

QUESTIONS FOR LEE THOMAS

Question 2: SARA provides that waivers from applicable state and Federal cleanup standards might be employed under certain conditions. How often has this occurred, and what bases were cited for the waiver?

Answer: Under SARA, there have not been any waivers of applicable or relevant and appropriate requirements (ARARs) employed in any ROD. Prior to SARA, there were only 2 RODs which employed the original fund balancing waiver under CERCLA (i.e. selected a remedy that provides adequate protection of public health and the environment considering the amount of money available in the Fund to respond to other sites). The Outboard Marine Corporation, IL ROD (5/84) employed a partial waiver of federal PCB disposal requirements, and the Iron Mountain Mine, CA ROD (10/86) employed a partial waiver of federal water quality standards. These are the only two RODs which have employed a waiver in over 300 RODs which have been signed to date.

QUESTIONS FOR LEE M. THOMAS, ADMINISTRATOR, EPA

Question #3: What are the constraints on the uses and applications of innovative technologies? To what extent are the new technologies being developed by contractors in the field or by findings from EPA's SITE program? How are the SITE program products being distributed to the industry?

Answer: There are several constraints or impediments to the broader use of innovative technologies to cleanup Superfund sites. These impediments are regulatory, institutional and informational. Of these, we believe that the lack of adequate information on the capability of innovative technologies is the major constraint. There is often inadequate information available on the effectiveness, reliability, and cost of these technologies to allow a thorough assessment of their performance on a Superfund waste. Remedies are approved after a cost-effectiveness analysis involving other treatment and disposal alternatives. Although innovative technologies may be selected, and are even encouraged, there are factors working against their selection when decision-makers face unknown about their eventual performance. The public may also be reluctant to accept on-site treatment options unless the alternatives have been proven effective and safe. Furthermore, it can be difficult to negotiate the use of alternative technologies with responsible parties when these units have not been proven in the field.

One way that EPA is working to overcome the informational impediment is through the SITE program. This program provides interested developers an opportunity to demonstrate the capabilities of their technology at Superfund sites. EPA oversees these projects and is responsible for the sampling and analysis leading to an assessment of performance. The emphasis is on demonstrating technologies under conditions which parallel actual cleanup efforts. The data are subject to vigorous quality control and the testing is directed to obtaining the information necessary for an assessment of the technologies by EPA and State site managers.

We believe that findings from the SITE program will lead to development of the most applicable technologies. Currently, there are 21 technology developers participating in the program representing a range of biological, thermal, physical/chemical, and solidification technologies. Six field demonstration efforts have already been completed and the result will be quite useful to EPA and State analysts.

EPA will document the SITE demonstration results in reports to be made available to Federal, State, and private cleanup managers and other interested parties. Information will be available through a clearinghouse which has been established to collect and disseminate technology performance data. The clearinghouse has three components:

- A hotline, provides callers up-to-date information on SITE projects, demonstration schedules and the availability of the results, and will also refer callers to other sources of information.
- An electronic bulletin board, part of a planned computerized data base network provides summary information on the SITE projects, demonstration schedules and results. Currently, this bulletin board is available only to Federal and State hazardous waste cleanup personnel.
- Reference Library, a collection of reports, journals, and other documents is housed in the EPA Library's Hazardous Waste Collection. This collection is available at EPA's 10 regional and 5 laboratory libraries. The bibliographic database is accessible using a personal computer. SITE documents will be added as they become available.

Attachment 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 30 1987

OFFICE OF
SOLID WASTE AND EMERGENCY RESPON

MEMORANDUM

SUBJECT: Draft Guidance on Differentiating Alternative Technologies for the Removal Program (9380.2-05)

FROM: Timothy Fields Jr., Director
Emergency Response Division

Timothy Fields Jr.

TO: Oil and Hazardous Materials Coordinators
EPA Regions I - X

Superfund Branch Chiefs
EPA Regions I - X

Captain Robert L. Storch Jr., Chief
Marine Environmental Response Division, USCG

The attached document provides draft guidance to removal field personnel to differentiate among alternative technologies, identifying them as available, innovative, or emerging.

The guidance describes criteria used for determining the developmental status of a particular technology. Among the topics addressed are: definitions of alternative technology and the terms - available, innovative, and emerging; identification of Alternative Technologies; and a Summary of Alternative Technology Contracts Procurement. It is expected that this guidance will become part of the forthcoming Alternative Technology Guidance.

Please review the document and provide comments by October 25, 1987, to Elizabeth Zeller of my staff. If you have any questions, Elizabeth may be reached at, FTS 382-2190.

Thank you for your attention to this request.

Attachment

cc: Russ Weyer, MSCD
Art Weissman, PAS
Lee Tyner, OGC
Joe Freedman, OGC
Lloyd Guerci, OWPE
Frank Biros, OWPE
Alan Corson, OSWER
John Kingscott, OERR
George Turner, USCG
Hans Crump, ERD
Linda Garczynski, ROB
Colleen Carruthers, EOS
Mark Mjoness, WOS
Dick Mueller, PCMD
Tom Sullivan, PCMD
Joe Lafornara, ERT
Royal Nadeau, ERT
John Riley, RSCB

EPA

United States Environmental Protection Agency
Washington, DC 20460

OSWER Directive Initiation Request

1. Directive Number
9380.2-05

2. Originator Information

Name of Contact Person	Mail Code	Office	Telephone Number
Elizabeth Zeller	WH-548/B	OERR/ERD	382-2190

3. Title
Guidance on Differentiating Alternative Technologies

4. Summary of Directive (include brief statement of purpose) The purpose of this document is to provide removal program field personnel with guidance on identifying alternative technologies as either available, innovative, or emerging. This document presents general criteria based on developmental status. Use of the classification criteria will assist field personnel in technology selection and procurement. In addition, this document will direct field personnel on how to obtain the necessary concurrences and approvals for the use of an alternative technology.

5. Keywords
Superfund, CERCLA, SARA, Alternative Technology

6a. Does this Directive Supersede Previous Directive(s)? ☐ Yes ☒ No What directive (number, title)

b. Does It Supplement Previous Directive(s)? ☒ Yes ☐ No What Directive (number, title)
9380.2-1 Administrative Guidance for Removal Program Use of Alternatives to Land Disposal

7. Draft Level
☐ A — Signed by AA/DAA ☐ B — Signed by Office Director ☒ C — For Review & Comment ☐ In Development

This Request Meets OSWER Directives System Format

8. Signature of Lead Office Directives Coordinator
Date

9. Name and Title of Approving Official
Timothy Fields, Jr., Director/ERD Timothy Fields Jr.
Date 9/30/87

OSWER OSWER OSWER
DIRECTIVE DIRECTIVE

****DRAFT****
September 4, 1987

GUIDANCE ON DIFFERENTIATING ALTERNATIVE TECHNOLOGIES FOR THE REMOVAL PROGRAM

I. PURPOSE

The purpose of this document is to provide removal program field personnel with guidance on identifying alternative technologies as either available, innovative, or emerging. This document presents general criteria based on developmental status. Use of the classification criteria will assist field personnel in technology selection and procurement. In addition, this document will direct field personnel on how to obtain the necessary concurrences and approvals for the use of an alternative technology.

II. BACKGROUND

There is concern in the scientific community and the general public over the long-term reliability of containment technologies (e.g., landfills, containment lagoons) used as disposal options at Superfund removal sites. Because these and similar disposal options do not render the waste non-hazardous, they are not permanent cleanup solutions. In response to these concerns, the Superfund Amendments and Reauthorization Act of 1986 (SARA) explicitly addresses, promotes, and sponsors the use of alternative technologies to effect permanent cleanups.

An effort is under way by EPA to maximize the use of alternative technologies at Superfund removal sites through amendments to the National Contingency Plan (NCP); development of policies and documents such as the Alternative Technology Guidance, Land Disposal Restriction Guidance, and the Engineering Evaluation/Cost Analysis Guidance; compliance with the Resource Conservation and Recovery Act (RCRA) and the Toxic Substances Control Act (TSCA); and implementation of the Superfund Technology Transfer program. The alternative technology provisions in these policies and programs were developed to encourage permanent cleanups in a safe, cost-effective manner.

****DRAFT****
September 4, 1987

III. DEFINITIONS

The Superfund Amendments and Reauthorization Act of 1986 (SARA) defines an alternative technology as a "series of unit operations or any unit operation that permanently alters the composition of hazardous waste through chemical, biological, or physical means so as to significantly reduce toxicity, mobility, and/or volume of the hazardous waste or contaminated materials being treated." For the purpose of this document, alternative technologies are defined by their development status. The Superfund Innovative Technology Evaluation (SITE) Strategy and Program Plan identifies three levels of development:

(1) *Available Alternative Technology* - A technology, such as several forms of incineration, that is fully proven and in routine commercial or private use;

(2) *Innovative Alternative Technology* - Any fully developed technology for which cost or performance information is incomplete, thus hindering routine use at CERCLA hazardous waste sites. An innovative alternative technology requires full-scale field testing before it is considered proven and available for routine use; and

(3) *Emerging Alternative Technology* - An alternative technology in an early stage of development; research has not yet successfully passed laboratory- or pilot-scale testing.

IV. CRITERIA FOR DIFFERENTIATING ALTERNATIVE TECHNOLOGIES

The criteria for classifying a technology as ~~available,~~ Existing, innovative, or emerging are based on the developmental status (including performance evaluation of the process, i.e., types of tests performed and the results). The criteria listed in this section are subjective; all technologies may not meet all of the criteria in a particular category based on the performance evaluation. However, by incorporating good engineering foresight and past performance records (particularly from other CERCLA-funded sites), one should be able to decide which category is most appropriate for that technology. The number of uncertainties will ultimately be the deciding factor between available and innovative or innovative and emerging. Since emerging technologies are usually in the early stages of development, it will not be difficult to distinguish between available and emerging technologies. In general, any data available for emerging technologies are based on bench- or pilot-scale tests, whereas performance and reliability records for available technologies at the full-scale stage are obtainable for review.

The OSC should be fully cognizant of the following information prior to determining the category of the alternative technology:

1. The types of tests required before full-scale implementation;
2. Modifications to the process or technology necessary before implementation; and
3. The performance record of the technology.

It should be noted that although a technology may be classified as available or innovative, some modification of standard or past operating configuration is usually required to achieve successful results. There will be a different set of concerns with each technology, depending on site conditions and the contaminant present. The attainability of the technology (e.g., in a particular Region or State) has no bearing on its classification as available, innovative, or emerging. The provision of various levels of cost data, however, may allow for the upscale of innovative and emerging technologies.

Generally, available technologies should meet all the criteria listed below; innovative technologies would meet most of the criteria, in whole or in part, while emerging technologies would fail to meet any of the criteria sufficiently. Application of the criteria is shown in Exhibit 1. Good engineering foresight and professional judgment in conjunction with the criteria will be required to make an effective determination of the appropriate category.

The criteria for differentiating alternative technologies are:

1) The technology has successfully passed bench-scale testing.

2) The technology has successfully passed pilot-scale testing.

3) The technology has accomplished full-scale waste treatment under site conditions which did not differ significantly from site conditions of previous applications.

4) The technology has been used successfully to treat the same concentration of contaminants under site conditions which did not differ significantly from site conditions for previous applications.

5) The technology is routinely used at CERCLA hazardous waste sites.

6) Operation and maintenance records are available for review prior to implementing the technology.

7) The technology is generally available in the commercial/industrial market.

8) The technology will produce emissions/effluents that are easy to manage from environmental, cost, and health standpoints.

9) The technology is a valid comparison to previous methods of disposal in terms of providing better treatment or destruction of hazardous waste.

10) Demonstration and performance data are available for review.

V. IDENTIFICATION OF ALTERNATIVE TECHNOLOGIES

Information on potential alternative technologies for removals may be obtained from various sources, such as: the Removal Alternative Technology List; ORD Publications Announcement and Technology Transfer Newsletter; ERT Technology Bulletins; the Superfund Regional Technology Transfer Contact; the Superfund Technology Transfer Program; the Superfund Innovative Technology Evaluation Program; various industry publications (trade journals); or discussions with OSCs.

Alternative Technology List

An initial compilation of known technologies developed by ORD is shown in Exhibit 2. The technologies are identified by their treatment process and development status, and were constructed by interpreting scientific data and information currently available. These tables are presented in draft form and will be replaced with a final version as soon as they become available.

Technologies are always evolving as development continues and improvements are made. Because the developmental status of a particular technology may change, the technology's original classification may also change. For example, technologies originally classified as emerging may continue to develop through pilot- and full-scale testing. If further tests are successful, the technology may be classified as innovative. It is important to note that although a technology may be classified as available for the treatment of a particular waste stream or media; it may, however, be classified as innovative for another waste stream since its performance for treating the latter may not be fully proven. As technology development and improvement occur, the information in Exhibit 2 will be updated and periodically distributed to all Regions.

VI. SUMMARY OF ALTERNATIVE TECHNOLOGY CONTRACTS PROCUREMENT

The approval, procurement, and use of an alternative technology is dependent upon the technology's development status. This section describes contract procurement procedures for available, innovative, and emerging technologies. Exhibit 3 summarizes the concurrence procedures for all of the technologies.

A. Available Technologies

Generally, the use of available technologies is supported by Headquarters and procurement/implementation is straightforward. The majority of removal actions involving available alternative technologies are conducted through cleanup contracts (ERCS, Regional, and Site-Specific). Non-competitive subcontracts, fully documented by the contractor to justify sole source procurement and to verify reasonable costs, may be used.

B. Innovative Technologies

To use innovative technologies, (or a technology for which the development status is uncertain), Regions must consult with ERD and obtain Headquarters concurrence. The Regions are required to send a memorandum to the Director of ERD, outlining the technology. The memorandum should contain as much relevant technical and site information as possible. Technical information necessary to fully review a technology may include, but is not limited to: performance evaluation of full-scale testing; results from past usage at CERCLA-funded removals (if applicable); bench- or pilot-scale test results specific to the site conditions and contaminants; and potential and/or known modifications necessary before implementation. Copies of the memorandum should be forwarded to the Chief of the Environmental Response Team (ERT), the Procurement and Contracts Management Division (PCMD), the Regional Coordinator, and the ERCS Project Officer. The ERT will review and evaluate the technology before approval is given for its use. Reasonable costs must be established for the proposed innovative technology. When the cost of the technology exceeds $500,000, consent by PCMD will be required, and an audit of the vendor's proposal must be performed by the Office of the Inspector General.

C. Emerging Technology

It is important to note that ERD and PCMD must be consulted before deciding to use an emerging technology as an option. The Superfund program generally does not sponsor emerging technologies with the possible exception of demonstration projects and performance-based contracts. These contracts require specific cleanup and/or treatment achievements as a basis for payment (performance-based contracts may also be considered for available and innovative technologies.) Only where stated goals are met do contractors receive payment.

An engineering evaluation/cost analysis (EE/CA) is required for non-time-critical removal actions (actions which allow at least a 6-month planning period before on-site action must be initiated) regardless of the technology's status. Procedures for drafting and submitting such an analysis are described in the upcoming EE/CA Guidance for Non-Time-Critical Removal Actions.

Procurement and contracting considerations are detailed in the forthcoming Alternative Technology Guidance.

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I. BIOLOGICAL TRE[illegible]NT TECHNOLOGIES

TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE *	MOBILE *	REFERENCE
Activated Sludge	Soluble organics in dilute aqueous waste streams (< 1% suspended solids).	BOD < 11,000 ppm. Requires low concentrations of heavy metals, PCBs, pesticides, oil and grease. Output sludge contains heavy metals and refractory organics which require further treatment.	A	X	7,8,10
Aerated Lagoons	Industrial wastewater, organics with slow biodegradation potential, soluble organics in dilute aqueous waste streams.	Requires large area. Unsuitable for solids. Requires a temperate climate. Output sludge contains heavy metals and refractory organics which require further treatment.	A		7,8
Aerobic Treatment (sequential batch reactor, fluidized bed, fixed film fluidized bed with/without activated carbon, aerated biofilm reactor, membrane reactor)	Aqueous waste with low levels (BOD < 10,000 ppm) of nonhalogenated organics and certain halogenated organics (i.e., phenols, formaldehyde, PCP).	Requires consistent, stable operating conditions.	A,I	X	1,10,15
Anaerobic Treatment (fluidized bed, fixed film fluidized bed with/without activated carbon)	Aqueous slurry with low to moderate levels of non-chlorinated organic compounds containing less than 7% solids.	Requires consistent stable operating conditions. Unsuitable for oil and grease, aromatics and long chain hydrocarbons. Output sludge requires incineration	A,I	X	1,2,8,10

*PHASE = Phase of Development, A = Available, I = Innovative, E = Emerging   *MOBILE = Transportable

I. BIOLOGICAL TREA 'NT TECHNOLOGIES

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TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE *	MOBILE *	REFERENCE
Composting	Aqueous sludge with less than 50% solids, non-chlorinated hydrocarbons, high organic wastes including oils, tars, and industrial processing sludges.	Requires nutrient supplementation. Output sludge contains heavy metals.	A	X	7,8
Enzyme Treatment	Soluble organics in dilute aqueous waste streams.	Requires stable influent concentration.	E		
Genetically Engineered Organisms:		Requires pretreatment removal of heavy metals, oil, grease and VOCs.			
- Mycorrhizal	Soil-entrained hazardous waste constituents.		E		2
- Organo-mercurial Detoxifying Bacteria	Organomercurial-contaminated water, soil, and secure burial sites.		E		2,12
- PCB Degraders	PCB-contaminated soils.		E		2
- Soil Detoxifying Microorganisms	Various organic compounds in soils.		E		2
- Yeast Strain	Halogenated organics.		E		5
- White Rot Fungus *(Phanerochaete Chrysosporium)*	Toxic or refractory halogenated organics in soil (i.e., 2,3,7,8-TCDD, DDT, mirex, lindane, hexachlorobenzene).		E		2,4,12

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I. BIOLOGICAL TREA NT TECHNOLOGIES

TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE[1]	MOBILE[1]	REFERENCE
Rotating Biologic Contactor	Biodegradable dilute aqueous organic waste including solvents and halogenated organics.	Limited to low concentrations of heavy metals and concentrated refractory organics. Unsuitable for sludges or solids.	A	X	8,10
Trickling Filter	Soluble organics in dilute aqueous waste streams with less than 1% suspended solids including solvents and halogenated organics.	BOD < 5000 ppm. Output sludge contains heavy metals and refractory organics which require further treatment.	A	X	8,10
Waste Stabilization Pond	Soluble organics in dilute aqueous waste streams with less than 0.1% solids.	Not known.	A		

[1] PHASE = Phase of Development, A = Available, I = Innovative, E = Emerging [1] MOBILE = Transportable

II. CHEMICAL TREAT T TECHNOLOGIES

TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE [1]	MOBILE [2]	REFERENCE
Chlorinolysis	Concentrated liquid chlorinated organic waste streams with low contrations of sulfur and oxygen.	Unsuitable for solids and tars. Unsuitable for benzene and aromatics. Output carbon tetrachloride can be recovered.	I		8
Dehalogenation	Halogenated organics in soils and sludges that are partially dehydrated (i.e., PCBs, dioxins).	Requires heat and excess reagent.	I	X	1,2,4,5,10
Electrochemical Dehalogenation	Halogenated organics (i.e., PCBs).	Not known.	E		13
Electrolytic Oxidation	High concentrations cyanide (10%) and metals wastes.	Suitable for low solid content waste.	A		1,10
Hydrolysis	Solids, soils, sludges, slurries, or liquids contaminated with organic compounds.	Requires careful handlin of strong acids and alkalines. Reaction is performed a high temperatures and pressures requiring close monitoring.	A	X	1,10
Ion Exchange	Aqueous organic or inorganic waste streams, principally metals.	Suitable for liquid waste only.	A	X	1,7,8,10
Lignin Adsorptio	Aqueous organic or inorganic waste streams.	Not known.	E		2,5
Microwave Heating Process	Organic liquids or vapors.	Suitable for small quantities of highly toxic waste and material recovery.	E		5

[1]PHASE = Phase of Development; A = Available; I = Innovative; E = Emerging   [2]MOBILE = Transportable

II. CHEMICAL TREAT. T TECHNOLOGIES

TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE [1]	MOBILE [2]	REFERENCE
Neutralization	Corrosive liquid wastes both acids and bases.	Unsuitable for sludges and solids. Requires corrosion resistant equipment.	A	X	1,7,8,10
Oxidation (chlorination, ozonation, hydrogen peroxide, potassium permanganate, chlorine dioxide, hypochlorites)	Dilute aqueous waste (< 1% waste) containing organic/inorganic compounds.	Requires controlled reaction conditions. Suitable for liquids and sludges only.	A	X	1,7,8,10
Photooxidation using irradiated semiconductor oxides	Organics and inorganics present in leachates and industrial sludges.	Not known.	E		2,5
Polymerization	Organic compounds such as aromatics, aliphatics, and oxygenated monomers.	Application is limited to spills.	I		1,10
Precipitation	Aqueous organic and inorganic waste containing metals.	Requires optimization of the reaction pH for the specific mix of metals present. Output sludge requires further treatment. Cross-reactivity may occur for mixed-metals content waste. Unsuitable for sludges, tars, and slurries.	A	X	1,7,8,10

[1] PHASE = Phase of Development, A = Available, I = Innovative, E = Emerging [2] MOBILE = Transportable

II. CHEMICAL TREATM TECHNOLOGIES

TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE[1]	MOBILE[2]	REFERENCE
Reduction (sulfur dioxide, sodium borohydride, sulfite salts, ruthenium tetraoxide)	Dilute aqueous waste stream containing inorganic compounds especially metals (<1% heavy metal concentration).	Applicable to inorganic waste only. Suitable for liquid waste only.	I	X	1,7,8,10
UV/Photolysis	Liquid waste containing dioxins.	Suitable for liquids only.	E		1,4,5,10,12
Ultrasonic Dechlorination	Halogenated organics.	Requires controlled temperature conditions.	E	X	14

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III. PHYSICAL TREATMENT TECHNO IES (COMPONENT SEPARATION)

TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE[1]	MOBILE[2]	REFERENCE
Air Flotation (dissolved or induced)	Liquid waste containing oils or light suspended solids.	Liquid effluent may require further treatment.	A	X	8
Belt Filter Press	Biological and industrial sludges.	Filter cake may require further treatment.	A	X	1,8
Centrifugation (bowl, basket, disk)	Organic/inorganic liquids, slurries, and sludges containing suspended or dissolved solids or liquids where one component is nonvolatile. For example, wastewater sludge, wastes containing immiscible liquids, or wastes containing three distinct phases.	Unsuitable for tars, solids, dry powders, or gases. Not applicable for small size or low density particles.	A	X	1,8,10
Chamber Pressure Filtration (pressure leaf, tube element, plate and frame, horizontal plate)	Wastewater sludges, or sludges with a flocculated or adhesive nature.	Dewatering technology. Unsuitable for sticky or gelatinous sludges.	A	X	7,8,10
Granular Media Filtration	Liquid waste containing suspended solids and/or oil.	Requires pretreatment fo suspended solids concentration < 100 mg/l. Requires frequent backwashing.	A	X	1,8,10
Gravity Separation (coagulation, flocculation, sedimentation)	Liquids containing settleable suspended solids, oil, grease.	Liquid effluent may require further treatment. Unsuitable for heavy slurries, sludges, or tars.	A	X	8

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III. PHYSICAL TREATMENT TECHNOLOGIES (COMPONENT SEPARATION)

TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE [1]	MOBILE [2]	REFERENCE
High Gradient Magnetic Separation	Magnetic or paramagnetic particles in slurry.	Requires low concentration of magnetic materials. Limited to a 15% maximum total solid content.	E	X	10
In situ Soil Extraction	Soils with low levels of organics or inorganics/metals contamination.	Unsuitable for dry or organic-rich soils.	E	X	1,2
Oil Separation	Immiscible oily liquids in water that form an emulsion.	Not known.	A	X	
Vacuum Filtration (fixed media, rotary drum)	Organic or inorganic chemical sludges, metals and cyanides bound up in hydroxide sludges.	Dewatering technology. Unsuitable for sticky or gelatinous sludges.	A	X	1,8,10

[1] PHASE = Phase of Development; A = Available; I = Innovative; E = Emerging [2] MOBILE = Transportable

III. PHYSICAL TREATMENT TECI .OGIES (PHASE SEPARATION)

TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE[1]	MOBILE[2]	REFERENCE
Air Stripping	Aqueous and adsorbed organic and inorganic wastes with relatively high volatility and low water solubility such as chlorinated organics, aromatics, and ammonia.	Limited to VOC concentration < 100 ppm. Suspended solids may clog tower.	A	X	1,2,7,8,10
Artificial Freezing	Sludges and soils contaminated with organics or metals.	Not known.	I	X	2
Carbon Adsorption	Aqueous organic wastes (containing <1% total organics and < 50 ppm solids) with high molecular weight and boiling point, and low water solubility, polarity and ionization.	Unsuitable for metals.	A	X	1,7,8,10
Colloidal Gas Aphrons (CGAs) (enhances air stripping and biodegradation)	Soils contaminated with phenols, phthalate esters, aromatic hydrocarbons, aliphatic hydrocarbons, chlorinated hydrocarbons, amines and alcohols.	Hydraulic conductivity of the soil must be $> 10^{-4}$ cm/sec.	E		2
Distillation	Liquid organic mixtures with low viscosity that can be separated due to molecular weight/volatility differences.	Unsuitable for thick polymeric materials, slurries, sludges, or tars.	A	X	1,8,10

[1] PHASE = Phase of Development, A = Available, I = Innovative, E = Emerging [2] MOBILE = Transportable

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III. PHYSICAL TREATMENT TECH)GIES (PHASE SEPARATION)

TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE¹	MOBILE²	REFERENCE
Electrokinetics	Soils contaminated with organic or inorganic waste.	Soil matrix must be relatively permeable and saturated.	I		2
Evaporation	Organic/inorganic liquid solvents contaminated with nonvolatile impurities (i.e., oil, grease, paint solids, polymeric resins).	Liquids must be volatile. Unsuitable for tars, solid, dry powders, or gases. Energy-intensive process	A	X	1,8,10
Freeze Crystallization	Dilute aqueous organic/inorganic waste solutions containing < 10% total dissolved solids.	Unsuitable for foamy, viscous or high solid content waste streams.	E		2
Mechanical Soil Aeration	Volatile organics in sludge and soil.	Effluent may require further treatment.	A	X	7
Metal Binding	Metal-contaminated aqueous waste streams, leachate or groundwater.	Limited to metal concentrations between 500-1000 ppm.	E		2
Resin Adsorption	Aqueous waste streams containing soluble organics particularly phenols and explosive materials.	Limited to low concentrations of organics (<8%) and suspended solids (<50 ppm).	A		8
Reverse Osmosis	Aqueous waste streams containing <400 ppm heavy metals, high molecular weight organics, and dissolved gases.	Unsuitable for oxidants. Requires controlled pH, low concentration of suspended solids, and no strong oxidants.	I	X	2,5,8

¹PHASE = Phase of Development; A = Available, I = Innovative, E = Emerging   ²MOBILE = Transportable

III. PHYSICAL TREATMENT TECH OGIES (PHASE SEPARATION)

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TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE¹	MOBILE²	REFERENCE
Solvent Extraction	Aqueous stream contaminated with single or multi-component dissolved organic wastes. Sludge contaminated with oil, toxic organics, and heavy metals.	Extracting solvent must be immiscible in the liquid and differ in density so gravity separation is possible. Suitable for sludges containing < 20 wt % oil/organics and < 20 wt % solids.	I, A	X	8,10,12,15
Steam Stripping	Aqueous solutions of volatile orgnics.	Effluent may require further treatment. Suitable for waste streams with low metal concentration.	A	X	1,2,7,8,10
Supercritical Extraction	Sludges, solids, or liquids contaminated with organics.	Effluent may require further treatment.	E	X	2,10,15
Ultrafiltration	Removes oils, metals and proteins from aqueous solutions with dissolved organics, emulsions, and colloidal particles.	Limited to low concentrations of suspended soils.	A	X	8

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IV. STABILIZATION/SOLIDIFICATION/ENC. ULATION TREATMENT TECHNOLOGIES

TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE[1]	MOBILE[2]	REFERENCE
Cement-based Fixation	Treated sludges and soils containing metal cations, radioactive wastes, and solid organics (i.e., plastics, resins, tars).	Long term stability/ leachability is unknown. Lignite, silt or clay increase setting time. Dissolved sulfate salts, borates, and arsenates must be limited.	A	X	1,6,10,15
Macro-Encapsulation, Overpacking, Thermoplastic and Thermosetting Techniques	Chemically or mechanically stabilized organic, inorganic, and radioactive wastes.	Encapsulating matrix must be campatible with waste. Long term leachability unknown, therefore, waste storage must be considered. Requires specialized equipment.	A	X	1,6,10
Pozzolanic-based Fixation (flyash, lime-based)	Treated sludges and soils containing heavy metals waste oils, solvents, and low level radioactive waste.	Borates, sulfates, and carbohydrates interfere with the process. Long term stability/ leachability is unknown.	A	X	1,6,10
Sorptive Clays (treated, chemically modified).	Halogenated organic compounds and heavy metals.	Long term leaching is a problem, therefore, waste storage must be considered.	I	X	2,5,6
Vitrification	Soils contaminated with organic, inorganic, and radioactive wastes.	Limited to soils with high silica content.	A/I	X	1,2,4,10

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V. THERMAL TREAT IT TECHNOLOGIES

TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE [1]	MOBILE [2]	REFERENCE
Electric Reactor	Soils contaminated with solids and liquid organics and inorganics.	Contaminated soil must be finely divided and dry.	I	X	1,2,4,10,11, 15
Electric Pyrolysis	Viscous liquids, sludges, solids, high ash materials, salts and metals and halogenated waste.	Requires homogeneous waste input. Metals and salts in the residue can be leachable.	I	X	1,10,15
Fixed Hearth	Bulky solids, liquids and sludges.	Particle size must be large enough not to fall through grate.	A		8
Fluidized Bed	Organic solids, liquids, and sludges.	Requires low water and inert solid content.	A	X	1,2,4,8,10,12,15
Industrial Boiler	Granulated solids, liquids, and sludges.	Requires low chlorine and sulfur content. Ash content clogs system. Particle size.	A		1,8,10
Industrial Kilns	Spent pot lining, nonhalogenated oils and PCB-contaminated liquids and sludge.	Chlorine and sulfur content must be limited. Particle size.	A		1,8,10,12
Infrared Incineration	Soils, solids, and sludges contaminated with chlorinated organic compounds (i.e., PCBs, dioxins, explosives).	Primarily for solid organic waste. Heavy metals are not fixed in ash.	A	X	1,4,10,15

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V. THERMAL TREA NT TECHNOLOGIES

TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE[1]	MOBILE[2]	REFERENCE
Liquid Injection	Pumpable liquid organic waste.	High inorganic content and heavy metal content must be limited. Chlorinated solvents cause accelerated corrosion rates.	A	X	1,5,8,10,12
Microwave Plasma	PCBs	Not known.	I		
Molten Glass	Organic solids, liquids, gases, sludges (i.e., (i.e., plastics, PCBs, asphalt, pesticides).	Sodium sulfates must be limited to <1% content. Inappropriate for soils and high ash waste.	I		1,2,10,11
Molten Salt	Low ash, low water content liquid or solid waste.	Corrosion problems. Requires frequent bed replacement.	I	X	1,7,10
Multiple Hearth	Granulated solids, sludges, tar, liquid, and and gaseous combustible waste.	Water, salt and metal content must be limited. Particle size must be small enough to pass through injector nozzles. Not recommended for hazardous wastes.	A		1,7,8,10,12
Plasma Systems	Liquid organic wastes (i.e., pesticides, dioxins, PCBs, halogenated organics).	Liquids only.	I	X	1,2,7,10,15
Pure Oxygen Burner	Liquid wastes which require high temperatures for destruction or have low heating values.	Requires specially engineered nozzles to atomize the liquid waste.	I	X	15

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V. THERMAL TREATMENT TECHNOLOGIES

TECHNOLOGY	APPLICABLE CONTAMINANTS	QUALIFYING FACTORS	PHASE¹	MOBILE²	REFERENCE
Radio Frequency Thermal Heating	Volatile, low boiling point, or easily decomposed organic compounds in soil.	Not known.	I	X	1,10
Rotary Kiln	Solid, liquid, or gaseous organic waste.	Containerized wastes are difficult to handle. High inorganic salt or heavy metal content wastes require special consideration. Fine particulate matter must be limited.	A	X	1,2,4,7,8,10, 12,15
Supercritical Water Oxidation	Aqueous organic solution/slurry or mixed organic/inorganic waste.	Not known.	I	X	1,4,10,11,12
Wet Air Oxidation	Aqueous waste streams (<5%) with dissolved or suspended volatile organic substances.	Unsuitable for solids, viscous liquids, or highly halogenated organic compounds. Not economical for dilute or concentrated waste.	A	X	1,7,10,11

¹PHASE = Phase of Development; A = Available, I = Innovative, E = Emerging ²MOBILE = Transportable

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QUESTIONS FOR LEE THOMAS

Question 4: How comfortable is the agency, particularly its project managers in the Regions, with its knowledge of the permanence of cleanup technologies? Is it possible that uncertainty and caution are in large part responsible for the slow pace of cleanup activities and NPL delistings? Are we studying and restudying in some cases to avoid making a decision?

Answer: EPA conducts ongoing technology transfer activities including publications, an electronic bulletin board, forums, etc. to keep EPA project managers and contractors abreast of the most current information on cleanup technologies. EPA acknowledges that RI/FS activities have taken too long to complete, and is currently conducting an RI/FS Improvements study to evaluate the major reasons for delays and initiate actions to shorten the RI/FS process.

QUESTIONS FOR L.M. THOMAS

Question 5: Given the state of new technology development, are potentially responsible parties being asked to pay for a "science fair", in effect, in which EPA and its contractors are applying unproven techniques to achieve uncertain results?

Answer: In an attempt to meet SARA's mandate of choosing remedies which permanently reduce the toxicity, mobility and volume of hazardous substances at Superfund sites, EPA has aggressively sought to develop and/or use emerging technologies towards this goal. EPA's SITES program has invested significant resources in developing and evaluating new treatment technologies for use in Superfund Remediations. Implementation of this directive has had a difficult beginning due to the immature state of available remedial technologies and the complex problems posed by the nature of Superfund sites.

The selection of a remedial action for a Superfund site is a complex process where numerous remedies undergo a detailed evaluation using specific selection criteria. These criteria include: short-term effectiveness, long-term effectiveness, reduction in toxicity, mobility and volume, implementability, cost, compliance with ARARS, overall protectiveness to human health and the environment, state acceptance and community acceptance. The selected remedy will obtain the best balance among the criteria. Promising, however, yet unproven technologies may be selected through this process. In these cases it is likely that bench scale or pilot scale treatability studies were performed in the Feasibility Study prior to the selection of the remedy, or will be incorporated into the Remedial Design phase prior to full scale implementation. Occasionally, treatability study results from tests on similar wastes at other facilities may be used in place of a site specific treatability study to base a decision on the likely success of the technology. Therefore, prior to actual implementation of an innovative technology there will be a high degree of certainty that it can be successfully implemented.

PRPs may promote the selection of innovative treatment technologies which offer permanence in the remedy, thus reducing future environmental liabilities and possibly at the same time offer significant cost savings over other identified conventional technologies.

SUPERFUND
Records Of Decision
Update

From: Hazardous Site Control Division
To: EPA Regional Offices

March 30, 1988
Vol. 4 No. 2

UPDATE ON GUIDANCE

The statutory requirements of CERCLA reauthorization and the Agency's efforts to streamline the remedial program have resulted in recent modifications to the RI/FS process. In an effort to communicate these program changes, a draft RI/FS Guidance was released for Regional review earlier this month. In addition, a series of 2-1/2-day RI/FS training workshops is being offered to Regional Remedial Project Managers, remedial staff, and State remedial personnel. (See the Calendar of Events for a schedule.) The objectives of the workshops are: (1) to provide a forum for discussing RI/FS policies and procedures, (2) to obtain Regional insight and ideas, and (3) to promote inter-Regional communication. The workshops will also provide an opportunity for Regional input before the RI/FS Guidance is completed.

Topics to be covered during the workshop will include streamlining the RI/FS process, site characterization, development of risk assessments and alternative management strategies, and administrative record requirements. Attendance at the workshop will be limited to enhance group discussion. For registration information, contact Margaret Barton at (301) 951-2200.

Distribution

Copies of the *Superfund ROD Update* will now be available through the EPA's Public Information Center in Washington, D.C. To receive an *Update*, please send a request to:

Environmental Protection Agency
Public Information Center
PM-211B
401 M Street, S.W.
Washington, D.C. 20024

CALENDAR OF EVENTS

RI/FS Training Workshop:

February 23-25	Washington, D.C.
March 15-17	Atlanta, GA
April 5-7	San Francisco, CA
April 19-21	New York, NY
May 3-5	Denver, CO
May 17-19	Dallas, TX
June 1-3	Philadelphia, PA
June 21-23	Chicago, IL
June 28-30	Boston, MA

FY '87 RECORD OF DECISION SUMMARY TABLE

The FY '87 Record of Decision (ROD) Summary Table provides an overview of site problems, selected remedies, clean-up criteria, and estimated costs provided for all RODs signed in FY '87. This table reflects remedial program accomplishments in incorporating treatment technologies into source control remedial actions. Seventy-five RODs were signed in FY '87. Forty-four of these RODs addressed final source control. The other 31 RODs addressed temporary storage, ground water actions only, and no further action. Of the 44 source control RODs, 27 employed treatment technologies. Thermal destruction was the technology most often selected in FY '87 (48%), while solidification was selected 26% of the time. Thirty-two RODs included ground water pump and treatment as part of the selected remedial action. Additional information will be available in the Annual ROD Report.

FY 1987 Record of Decision Summary Table by Selected Remedy Category

Incineration

Region/ Lead	Site/Contact	Signature Date	Operable Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
I S	Ottati & Goss, NH Paul Marchessault (FTS) 833-1626	01/16/87	1st	Soil, sediment and GW with TCE, PCBs, VOCs, organics and inorganics	19,000 yd^3	Onsite incineration of soil <20 mg/kg PCBs, aeration of soils >20 mg/kg PCBs and >1 mg/kg total VOCs; GW pump and treatment with reinjection	Soil, sediments, and GW will attain the health-based cleanup level of 10 [illegible]	$8,592,500 (capital) $1,736,000 (annual O&M)
I F	Davis Liquid Waste, RI	09/29/87	1st	Soil and GW contaminated with VOCs, inorganics, organics, oily wastes and pesticides	25,000 yd^3	Onsite incineration; onsite disposal of treated soils; GW pump and treatment with reinjection; alternate water supply	GW/soils will be treated to attain 10^{-5} cancer risk level.	$10,385,800 (capital) $4,525,000 (O&M for soil treatment)
II S	Williams Property, NJ Don Lynch (FTS) 264-8669	09/30/87	1st-Final	Soil and GW with PCE, organics and metals	700 yd^3 400 μg/l GW concentration	Offsite incineration of soils; GW extraction and treatment with reinjection; alternate water supply	Excavation of soil to 15 mg/kg or greater; GW will be treated to MCL	$513,750 (capital) $64,600 (annual O&M)
IV F	Geiger (C&M Oil), SC Al Cherry (FTS) 257-2643	06/01/87	1st	Soil and GW contaminated with organics, metals, and PCBs	11,300 yd^3, 62,000,000 gal	Onsite thermal treatment of soil; solidification/ stabilization; GW pump and treatment with discharge to SW	Soil will be treated to achieve MCLs; GW will attain the cumulative 10^{-5} cancer risk	$5,583,000 (capital) $367,200 (present worth O&M)
IV E	Sodyeco, NC Giezelle Bennett (FTS) 257-3402	09/24/87	1st-Final	Soil, SW and GW contaminated with organics, base/ neutrals and VOCs	150 yd^3 area D soil	Limited onsite incineration of contaminated soil; GW pump and treatment with offsite discharge to SW	Soil will attain all ARARs following GW remediation. GW will meet Federal Drinking Water Criteria.	$2,089,000 - $3,865,000 (present worth)
IV F	Tower Chemical, Fl Chris Teepen (FTS) 257-2643	09/30/87	1st-Final	Soil and GW contaminated with pesticides and metals	4,000 yd^3 100,000,000 gal	Onsite thermal treatment of soils (if non-hazardous, backfill treated soil and debris onsite), GW pump and onsite treatment with discharge to SW; individual treatment units for private wells	Soil will attain the 10^{-6} risk level; GW treatment will attain 10^{-6} risk level	$6,786,000 (capital)
V F	Laskin/Poplar, OH Donna Twickler (FTS) 353-3236	09/30/87	2nd	Soil contaminated with PCBs, PAHs, VOCs and inorganics	900,000 yd^3	Onsite incineration of soil; offsite disposal of all incinerator ash; offsite treatment of waste water; offsite disposal of all tanks	NA	$8,490,865 (present worth)
V S	Rose Township, MI Kevin Adler (FTS) 886-0403	09/30/87	1st-Final	Soil and GW contaminated with VOCs, TCE, PCBs, organics, inorganics and pesticides	50,000 yd^3	Onsite thermal destruction of soils; disposal of ash as either backfill or placed in an offsite RCRA facility; GW pump and treatment, fencing	Soil will attain 10^{-6} cancer risk; GW levels will also attain the 10^{-6} risk level	$32,547,000 (capital) $200,000 (annual O&M, years 0-10) $70,000 (annual O&M years 11-30)
VI F	Bayou Bonfouca, LA Kathleen O'Reilly (FTS) 255-6710	03/31/87	2nd-Final	Soil, sediments, and GW contaminated with PAHs and inorganics	71,500 yd^3	Onsite incineration of soil, onsite disposal of ash and capping; GW pump and onsite treatment with reinjection	Soil contamination >1,300 mg/kg PAHs will be treated; >100 mg/kg PAHs will be capped; GW treatment will target the 10^{-4} to 10^{-6} risk level.	$25,000,000 (capital) $100,000 (annual O&M)
VI F	Cleve Reber, LA Gary Bondy (FTS) 255-6710	03/31/87	1st	Soil, SW and GW contaminated with organics	8,400 drums 220,000 yd^3 500,000 gal	Onsite incineration of drums and sludges; RCRA cap; gas venting pipes; pond water pump and treatment with discharge to SW	Remediation will attain the 10^{-6} cancer risk level.	$59,594,534 (capital) $173,748 (annual O&M)

Key
NA - Not available/not applicable
S - State lead
F - Federal lead
RP - Responsible party lead
E - Enforcement lead

FY 1987 Record of Decision Summary Table by Selected Remedy Category

Incineration (continued)

Region/ Lead	Site/Contact	Signature Date	Oper-able Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
VI E	Hardage/Criner, OK Alan Tavenner (FTS) 255-6735	11/14/86	1st	Soil and GW contaminated with organics, TCE, PCBs and VOCs	180,000 yd^3 10,000-20,000 drums	RCRA cap; onsite or offsite incineration of organic liquids; physiochemical treatment with discharge to POTW	NA	$88,014,000 (capital) $2,282,000 (present worth O&M)
VI S	Sand Springs Petrochemical Complex, OK Paul Sieminski (FTS) 255-6719	09/29/87	1st	Soil, SW, pits and GW contaminated with TCE, VOCs, benzene, organics and inorganics	130,000 yd^3 715,000 gal	Offsite thermal destruction of sludges; solidification/stabilization of remaining sludges; containment in an onsite RCRA landfill	NA	$37,453,050 (capital) $15,000 (annual O&M)
VI E	Gurley Pit, AR Tim Underwood (FTS) 255-6735	10/06/86	1st	Soil and SW contaminated with PCBs and organics	432,470 ft^3 4,100,000 gal	Stabilization of sludge, soil and sediment with placement in onsite RCRA landfill; incineration of oil; and onsite treatment of contaminated water	NA	$16,780,000 (capital) $21,000 (annual O&M)

Solidification/Fixation

Region/ Lead	Site/Contact	Signature Date	Oper-able Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
II F	Chemical Control, NJ Rick Schwarz (FTS) 264-1252	09/23/87	2nd	Soil contaminated with organics and inorganics	18,000 yd^3	In situ fixation of soils, removal of debris, and sealing of a sanitary sewer	NA	$7,208,000 (capital) $57,400 (annual O&M years 0-4) $32,400 (annual O&M years 5-30)
IV E	Gold Coast, FL Meredith Anderson (FTS) 257-2643	09/11/87	1st-Final	Soil and GW contaminated with VOCs and metals	1,500 yd^3 100,000 gal	Stabilization of soils with onsite disposal/capping, offsite disposal of sludges and soils; GW extraction and treatment	Soils will be excavated to the 10^{-4} risk level, GW treatment will attain MCLs	$3,711,660 (capital)
IV F	Independent Nail, SC Michelle Glenn (FTS) 257-3402	09/28/87	1st	Soil and sediments contaminated with metals	6,200 yd^3	Solidification/stabilization of soil; backfilling of treated soil and cover	Soil will attain a 10^{-6} risk level	$1,032,000 (capital) $22,500 (O&M years 0-1) $5,600 (O&M years 2-30)
IV F	Geiger, SC (refer to Incineration)							
V F	Liquid Disposal Landfill, MI John Tanaka (FTS) 886-6337	09/30/87	1st-Final	Soil and GW contaminated with PCBs, VOCs, organics, inorganics	NA	Onsite solidification of soil and waste; GW pump and treatment with discharge to SW; slurry wall and cap	Soil and GW based on 10^{-6} health-based risk level	$21,743,100 (capital) $316,600 (present worth O&M)
V RP	Northern Engraving, WI Doug Ballotti (FTS) 886-4752	09/29/87	1st-Final	Soil, sludge and GW contaminated with VOCs, organics and inorganics	4,400 yd^3	Onsite solidification of sludge and soil; RCRA cap; institutional controls to include deed and access restrictions	GW cleanup through the use of ACLs	$295,000 (capital) $16,000 (annual O&M)
VI S	Sand Springs, OK (refer to Incineration)							

FY 1987 Record of Decision Summary Table by Selected Remedy Category

Stabilization/Neutralization

Region/ Lead	Site/Contact	Signature Date	Oper-able Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
VI E	Mid South, AR Tim Underwood (FTS) 255-6735	11/14/86	1st-Final	Soil, sediments and GW contaminated with PAHs, organics and inorganics	46,750 yd^3	Consolidation/stabilization, capping of soils; institutional controls to include fencing and deed restrictions; GW pump and treatment	Specific soil goals based on the 10^{-5} risk level	$3,500,000 (capital) $153,500 (annual O&M)
VI E	Gurley Pit, AR (refer to Incineration)							

Volatilization/Aeration

Region/ Lead	Site/Contact	Signature Date	Oper-able Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
I S	Ottati & Goss, NH (refer to Incineration)							
II F	Waldick Aerospace, NJ [illegible] (FTS) 264-8475	09/29/87	1st	Soil contaminated with TCE, VOCs and inorganics	10,500 yd^3	In situ air stripping of soils; offsite disposal of residuals; institutional controls to include site access and well restrictions; fencing	Soils will be excavated to New Jersey Department of Environmental Protection levels	$2,600,118 (capital) $66,000 (annual O&M)
V E	Seymour Recycling, IN [illegible] (FTS) 886-4726	09/04/87	2nd-Final	Soil, sediments and GW contaminated with organics, TCE, PCE, and inorganics	3,000 yd^3 150 gpm	Multi-media cap; soil vapor extraction system; GW pump and treatment; institutional controls to include deed and access restrictions with compliance point at the edge of the cap	GW cleanup levels will attain a cumulative 10^{-5} to 10^{-6} cancer risk level.	$10,536,000 (capital) $7,200,000 (present worth O&M)

Soil Washing/Flushing

Region/ Lead	Site/Contact	Signature Date	Oper-able Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
IV F	Palmetto Wood, SC Al Cherry (FTS) 257-3402	09/30/87	1st-Final	Soil and GW contaminated with metals	19,895 yd^3 10,500,000 gal	Onsite soil flushing; GW pump and treatment with discharge to offsite SW; AWS	Soil cleanup will attain public health evaluation levels; GW to attain MCL	$3,710,000 (capital) $299,153 (annual O&M)
I F	Davis Liquid Waste, RI (refer to Incineration)							

Biodegradation

Region/ Lead	Site/Contact	Signature Date	Oper-able Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
II E	Renora, Inc., NJ Perry Katz (FTS) 264-8678	09/29/87	1st	Soil and GW contaminated with PCBs, PAHs, VOCs, inorganics	1,100 yd^3 4,400 yd^3	Biodegradation of PAH soils; off-site disposal of PCB soils	Soil: VOCs 1 mg/kg, PAHs 10 mg/kg, VOCs 50 µg/l, and various inorganic levels	$1,344,000 (capital, biodegradation costs not included)

Other

Region/ Lead	Site/Contact	Signature Date	Oper-able Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
I F	Re-Solve, MA Dave Lederer (FTS) 833-1606	09/23/87	2nd	Soil, sediments and GW contaminated with PCBs, VOCs and inorganics	22,500 yd^3 3,000 yd^3	KPEG dechlorination, onsite placement of soil; GW pump and treatment with reinjection. Include institutional controls.	Soils will be treated to 25 mg/kg PCBs; sediments will be treated to 1 mg/kg; GW will be treated to the 10^{-5} cancer risk.	$13,748,900 (capital) $1,097,000 (present worth O&M)

FY 1987 Record of Decision Summary Table by Selected Remedy Category

Other
(continued)

Region/ Lead	Site/Contact	Signature Date	Operable Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
III F	Palmerton Zinc, PA Walt Graham (FTS) 597-8987	09/04/87	1st	Defoliation of mountainside from zinc, lead, cadmium and sulfur dioxide contamination	2,000 acres	Application of fly ash and offsite sludge on target areas; application of grass seed, seedlings and mulch	State loading rates for metals	Minimal to none
III E	West Virginia Ordnance Works, WV Hector Abrev (FTS) 597-9562	03/31/87	1st	Soil and sewer line contamination with organics and asbestos	4,305 yd^3	In situ flaming treatment; capping of treatment residuals; offsite disposal of asbestos; deed restrictions	Nitroaromatics at 50 mg/kg	$1,807,000 (capital)
VIII F	Central City/Clear Creek, CO Holly Fliniau (FTS) 564-1839	09/30/87	1st	Drainage containing heavy metals	NA	Passive/active treatment system for acid mine drainage discharge	NA	$2,000,000

Containment/Disposal

Region/ Lead	Site/Contact	Signature Date	Operable Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
II RP	Diamond Alkali, NJ Jon Josephs (FTS) 264-8098	09/30/87	1st	Soil, structures, GW and air contaminated with TCDD (dioxin) and DDT	NA	Slurry wall, offsite treatment or disposal of drums; secure all material with >1 μg/kg TCDD onsite; GW pump and treatment; and onsite placement and capping of sludge	Cleanup levels will attain 10^{-6} cancer risk level.	$8,068,000 (capital) $261,000 (annual O&M)
II E	GE Moreau, NY Nikki DiForte (FTS) 264-0870	07/13/87	1st	Soil, SW and GW contaminated with TCE, VOCs	6,600 yd^3	Excavation of soil and cap; SW and GW treatment with air stripping; extension of municipal water supply	Soil cleanup goals were not specified; GW and SW treatment will attain the MCL and State standards	$18,382,000 (capital) $78,000
II F	Volney Landfill, NY Bob Howe (FTS) 264-1263	07/31/87	1st	GW contaminated with VOCs and metals	4,000,000 yd^3	Capping, slurry wall; offsite or onsite treatment of leachate	MCL values, WQC values and the NY State values	$12,754,000 (offsite leachate treatment) $12,876,000 (onsite leachate treatment) (capital cost) $691,000 (onsite leachate treatment) $862,000 (offsite leachate treatment) (present worth O&M)
III F	Kane and Lombard, MD Stephany Del Ré (FTS) 597-0617	09/30/87	1st	Soil and GW contaminated with VOCs, PAHs, PCBs, and metals	67,000 yd^3	Removal of highly contaminated materials; onsite capping, subsurface containment, institutional controls	NA	$4,692,660 (capital) $28,930 (annual O&M)
III E	Saltville Waste Disposal, VA Jerry Amador (FTS) 597-3187	09/30/87	1st	Soil, sediments, SW, air and biota contaminated with mercury	NA	Runon controls; treatment of waste pond outfall, institutional controls	0.05 μg/l mercury in water (State standard)	$840,052-$2,143,052 (capital) $221,941-$258,941 (annual O&M) depending upon selection of sulfide ppt. or carbon system, respectively
IV E	Newport Dump Dennis Manganiello (FTS) 257-2234	03/27/87	1st	Soil, GW and sediments contaminated with metals, base/neutrals and PCBs	1,000,000 yd^3	Multimedia monitoring program, revegetation of existing clay cap	Organics will attain 10^{-6} health-based risk level; GW will attain 1,000 μg/l barium and 50 μg/l chromium	$518,000 (capital) $83,000 (O&M years 0-2) $135,000 (O&M years 3-30)

FY 1987 Record of Decision Summary Table by Selected Remedy Category

Containment/Disposal
(continued)

Region/ Lead	Site/Contact	Signature Date	Operable Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
IV RP	N.W. 58th Street Landfill, FL Mary Gail (FTS) 257-2643	09/21/87	3rd-Final	Soil and GW contaminated with VOCs and metals	27,000,000 yd^3	Landfill soil; capping; alternate water supply	GW action will provide compliance with MCLs	$2,500,000 (capital)
IV E	Powersville Landfill, GA Ben Moore (FTS) 257-2643	09/30/87	1st	Soil contaminated with pesticides	NA	Cap; grade; monitoring wells and gas vents; alternate water supply; institutional controls to include deed restrictions	NA	$5,000,000 (capital) O&M costs not stated
V E	Envirochem, IN Karen Vendl (FTS) 886-4739	09/25/87	1st	Soil, sediments, SW and GW contaminated with VOCs and organics; soil contaminated with PCBs; GW contaminated with inorganics	4,200 yd^3	Onsite disposal; RCRA multilayer cap; rerouting of SW; GW collection and treatment; institutional controls to include deed and access restrictions	GW will attain MCLs	$33,900,000 (present worth)
V RP	Johns-Manville, IL Brad Bradley (FTS) 886-4842	09/30/87	1st-Final	Soil, SW, GW and air contaminated with asbestos and inorganics	NA	Grading and covering waste materials, offsite disposal of asbestos-containing material; monitoring system	All media will attain NESHAP requirements for asbestos	$4,026,000 (capital) $49,000 (annual O&M)
V F	Marion-Bragg Landfill, IN Cindy Nolan (FTS) 886-0400	09/30/87	1st-Final	Soil, SW and GW contaminated with inorganics, PAHs, VOCs and organics	1,100,000 yd^3	Capping of site; flood control measures; additional GW studies	NA	$5,800,000 (capital) $1,000,000 (present worth)
V E	Northside Landfill, IN Karen Vendl (FTS) 886-4739	09/25/87	1st	Soil, sediments, SW and GW contaminated with PCBs, VOCs, organics and inorganics	4,200 yd^3	Onsite disposal of soils and sediments; RCRA cap; GW treatment system; institutional controls to include deed and access restrictions	GW will attain MCLs	$33,900,000 (present worth)
V F	Schmalz Dump, WI Margaret Guerriero (FTS) 886-0399	08/08/87	2nd-Final	Soil contaminated with lead and chromium $^{+3}$	NA	Cap approximately 7 acres of soil	NA	$687,664 (capital) $17,940 (annual O&M)
VI E	Bayou Sorrel, LA Judith Black (FTS) 255-6730	11/14/87	1st-Final	Soil, waste ponds and GW contaminated with pesticides, VOCs, inorganics and organics	38,400 yd^3	Capping former disposal area; venting system; slurry wall; consolidation of wastes or offsite disposal	NA	$23,200,000 (capital) $28,700,000 (total present worth)
VI S	Compass Industries, OK Paul Sieminski (FTS) 255-6710	09/29/87	1st-Final	Soil, sediments, SW and GW contaminated with organics and inorganics	630,000 yd^3 283,060 gal/yr	RCRA cap with diversion of SW, onsite treatment of GW in upper, perched water bearing zone	GW effluent solid levels will meet NPDES requirements	$9,255, 526 (capital) $272,830 (annual O&M)
VI S	Crystal City Airport, TX Jim McGuire (FTS) 255-6715	09/29/87	1st-Final	Soil and debris contaminated with inorganics and pesticides	12,000 yd^3	Onsite consolidation, RCRA cap over consolidation cell	Soil cleanup will attain a 10^{-5} health-based risk	$1,600,000 (present worth)
VII E	Conservation Chemical, MO John Chen (FTS) 757-2856	09/30/87	1st-Final	GW and onsite structures contaminated	NA	Capping; GW pump and treatment; monitoring	NA	$21,000,000

FY 1987 Record of Decision Summary Table by Selected Remedy Category

Temporary Storage

Region/ Lead	Site/Contact	Signature Date	Operable Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
VI S	Petro Chemical Systems, TX Sherry Fuerst (FTS) 255-6715	03/27/87	1st	Soil contaminated with benzene, VOCs and PAHs	4,000 yd^3	Temporary storage in an onsite RCRA facility; temporary relocation of residents	Soil will be excavated to below 100 mg/kg PAHs	$1,232,785 (capital) $4,750 (annual O&M)
VII F	Minker Stout/ Romaine Creek, MD Bob Field (FTS) 757-2856	09/28/87	2nd	Soil and sediment contaminated with TCDD (dioxin)	4,400 yd^3	Temporary storage of soil in onsite RCRA facility	Soil and sediments will be excavated to below 1 mg/kg TCDD (dioxin)	[illegible] (present worth) $28,000 (annual O&M)
VII F	Minker Stout/ Stout, MD Bob Field (FTS) 757-2856	09/28/87	3rd	Soil contaminated with TCDD (dioxin)	3,500 to 5,700 yd^3	Temporary storage of soil in an onsite RCRA facility; institutional controls to include site access restrictions	Soil will be excavated to below 1 mg/kg TCDD (dioxin)	$5,817,000-$7,018,000 (present worth) $6,000 (annual O&M)
VIII F	Denver Radium I, CO John Brink (FTS) 564-1518	09/30/87	4th	Soil is contaminated with radium and decay products	11,000 yd^3	Temporary onsite storage until a facility for permanent disposal becomes available with final offsite disposal	Radium-226 not to exceed background level by more than 5 pCi/g within 15 cm of the surface and 15 pCi/g more than 15 cm below the surface, and gamma radiation not to exceed background level by 2μR/hr.	$3,412,800 (capital) [illegible] (present worth O&M)
VIII F	Denver Radium II, CO John Brink (FTS) 564-1518	09/30/87	5th	Soil and buildings contaminated with radium and decay products	15,400 yd^3	Temporary onsite storage until a facility for permanent disposal becomes available with final offsite disposal (15,400 yd^3)	Radium-226 not to exceed background level by more than 5 pCi/g within 15 cm of the surface and 15 pCi/g 15 cm below the surface, and gamma radiation not to exceed background level by 2μR/hr	$4,035,600 (capital) $194,700 (present worth O&M)
VIII F	Denver Radium/ Card Property, CO John Brink (FTS) 564-1518	06/30/87	3rd	Soil, sediment and debris contaminated with radium and decay products	4,000 yd^3	Temporary onsite storage and final offsite disposal	Radium-226 not to exceed background level by more than 5 pCi/g within 15 cm of the surface and 15 pCi/g 15 cm below the surface, and gamma radiation not to exceed background level by 2μR/hr	$1,058,500 (capital) $89,500 (present worth O&M)
VIII F	Denver Radium/ Open Space Property, CO John Brink (FTS) 564-1518	09/30/87	7th	Soil contaminated with radium and decay products	1,310 yd^3	Onsite temporary containment followed by offsite disposal when available	Radium-226 not to exceed background level by more than 5 pCi/g within 15 cm of the surface and 15 pCi/g 15 cm below the surface, and gamma radiation not to exceed background level by 2μR/hr	$743,300 (present worth)
VIII F	Denver Radium III, CO John Brink (FTS) 564-1518	09/30/87	6th	Soil and debris contaminated with radium and decay products	Not provided	Onsite temporary containment of material followed by offsite permanent disposal when available	Radium-226 not to exceed background level by more than 5 pCi/g within 15 cm of the surface and 15 pCi/g, 15 cm below the surface, and gamma radiation not to exceed background level by 2μR/hr	$3,400,000 (present worth)

FY 1987 Record of Decision Summary Table by Selected Remedy Category

Groundwater Treatment

Region/Lead	Site/Contact	Signature Date	Operable Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
II S	Endicott Village Well Field, NY John McGahren (FTS) 264-8212	09/25/87	1st	GW contaminated with organics	3,700 gpm of water will be treated	GW treatment facility; purge well to intercept contamination	MCL for vinyl chloride of 2 µg/l	$1,300,000 (capital) $147,000 (annual O&M)
II S	Hawland Complex, NY Alex Posner (FTS) 264-0636	09/30/87	1st-Final	Sediments and GW contaminated with VOCs and inorganics	NA	GW pump and treatment; alternate water supply	NA	$1,257,500 (capital) $105,500 (annual O&M)
II F	Katonah Municipal Well, NY John McGahren (FTS) 264-8212	09/25/87	1st-Final	GW contaminated with PCE	370 ppm	Onsite treatment with discharge to POTW	PCE of less than 0.8 µg/l or nondetectable (10^{-6} risk)	$1,385,000 (capital) $386,000 (annual O&M)
II S	Montgomery Township, NJ Kathy Stryker (FTS) 264-1213	09/29/87	1st	GW contaminated with VOCs and inorganics	NA	Extension water supply system	Water will be monitored for compliance with MCLs	$319,000 (capital)
II E	Vega Alta, PR José Font (809) 725-7825	09/30/87	1st	GW contaminated with PCE, TCE and other VOCs	3,800,000 gal/day well field supply	Well pump and treatment with discharge to creek or public distribution system	Treatment of GW will attain the 10^{-6} risk level which will include MCL values under SDWA	$4,106,000 (capital) $581,000 (annual O&M)
V RP	FMC, MN Kerry Street (FTS) 886-7290	09/30/87	2nd-Final	GW contaminated with TCE, PCE and VOCs	82 lbs total VOCs	GW extraction and discharge of untreated GW to POTW; institutional controls	GW treatment will meet the MCLs; Michigan Recommended Drinking Water Limits will be met	$1,510,005 (present worth)
V F	Industrial Excess, OH Julie Mattiessen (FTS) 353-8758	09/30/87	1st-Final	GW contaminated with organics and inorganics	NA	Alternate water supply	NA	$1,715,870-$2,289,060 (present worth)
V F	New Brighton/Arden Hills/St. Anthony, MN Gene Wong (FTS) 353-6341	03/31/87	5th	GW contaminated with VOCs, PCE and TCE	Treatment of 3.3 mgd	Water treatment facilities with discharge to the municipal water treatment plant	GW treatment will attain the MCL	$1,100,600 (capital) $160,770 (annual O&M)
V E	New Brighton (TCAAP), MN Art Kleinrath (FTS) 886-7286	09/25/87	3rd	GW contaminated with VOCs and metals	NA	GW pump and treatment, onsite reinjection to aquifer	GW cleanup goals will attain 10^{-6} health-based levels	$4,000,000 (capital) $120,000 (annual O&M)
VIII E	Rocky Mountain Arsenal, CO Connally Mears (FTS) 564-1526	06/03/87	1st	GW contaminated with TCE, PCE and VOCs	NA	Water treatment system	Treatment will attain the proposed MCLs	$8,880,000 (or $10,100,000 with air stripping) (capital) $372,000 (annual O&M)
IX RP	Litchfield Airport, AZ Jeff Rosenbloom (FTS) 454-8565	09/26/87	1st	GW contaminated with TCD, DCE and organics	NA	GW pump and treatment	NA	$2,400,000
IX E	Operating Industries, CA Michele Dermer (FTS) 454-7415	07/31/87	1st	Leachate contamination	NA	GW pump and treatment, gas control systems	NA	$1,900,000 (capital) $700,000 (annual O&M)
IX S	San Fernando Valley, CA Jeanne Dunn (FTS) 454-7880	09/24/87	1st	GW contaminated with PCE, other organics	NA	GW pump and treatment	NA	$3,000,000

FY 1987 Record of Decision Summary Table by Selected Remedy Category

Groundwater Treatment
(continued)

Region/ Lead	Site/Contact	Signature Date	Operable Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
IX F	San Gabriel, CA Neil Ziemba (FTS) 454-7174	09/30/87	2nd	Contaminated GW	NA	Alternate water supply	NA	$2,800,000
IX S	Stringfellow Acid Pits, CA John Rendall (FTS) 454-7368	06/25/87	3rd	GW contaminated with organics, TCE, CBSA, spent solvents and heavy metals	NA	GW pump and treatment	NA	$2,000,000
X S	Colbert Landfill, WA Neil Thompson (FTS) 399-7177	09/29/87	1st-Final	GW contaminated with TCE, PCE, VOCs and methylene chloride	NA	Alternate water supply	Cleanup goals based on MCLs	$24,000,000 (present worth)

No Further Action

Region/ Lead	Site/Contact	Signature Date	Operable Unit	Threat/Problem	Waste Volume	Components of Selected Remedy	Cleanup Goals	Capital/O&M Costs
II F	Cooper Road, NJ Ed Hanlon (FTS) 264-1784	09/29/87	1st-Final	None	None	No further action	NA	None
II RP	South Brunswick Township Landfill, NJ Pat Evangelista (FTS) 264-6311	09/30/87	1st-Final	None	NA	Remediation completed in 1985; monitoring will continue for 30 years	NA	NA
II S	Suffern Well Field, NY Dick Kaplan (FTS) 264-1861	09/25/87	1st-Final	GW contaminated with VOCs	None	No further action with GW monitoring	Levels comply with the NYSDEC guideline	$311,000 (present worth)
III RP	Presque Isle, PA Pat Tan (FTS) 597-3164	09/30/87	1st-Final	None	None	No further action	NA	None
IV F	Parramore Surplus, FL Tom Roth (FTS) 257-2643	09/15/87	1st-Final	Possible contamination of GW with metals	None	No further action remedy with monitoring of SW and GW	NA	$21,000 (capital) $19,000 (annual O&M)
IV E	Tri City Oil, FL Sam Vance (FTS) 257-2643	09/21/87	1st-Final	None	None	No further action	NA	None
VI F	Highland Acid Pit, TX Cynthia Aduddell (FTS) 255-6715	09/26/87	2nd-Final	Possible contamination of SW and GW with VOCs and heavy metals	None	No further action remedy with monitoring of SW and GW	NA	$4,700 (capital) $11,120 (1st year O&M) $6,980 (years 1-30)

Mr. OBERSTAR. If EPA is not going to use destruction technology at all of the sites, what percentage, what number of sites in round figures—and I won't hold you to this; I understand it's round numbers or an approximation number or percentage of sites—will destruction technology be used?

Mr. PORTER. Well, I think, Mr. Chairman, that we are going to be using treatment, and I'm not sure in some cases where treatment leaves off and destruction begins because you've got various chemicals, some of which you can destroy and some of which you can't, such as the metals.

But I think that treatment and, as much as possible, destruction will be used at a majority of the sites, probably a large majority.

That doesn't mean that every threat on that site will all be treated. What we are really heading toward, I think, is a mixture of technologies at sites. If it's a small site, and if things are concentrated, you will treat all of it. If it's the Rocky Mountain Arsenal, which is a square mile, you probably won't treat the whole square mile.

Mr. OBERSTAR. EPA isn't doing Rocky Mountain?

Mr. PORTER. We have to make the decision on that. The army will do the studies——

Mr. OBERSTAR. The army will do it.

Mr. PORTER. But if we don't agree with their remedy, we have to make the call.

Mr. OBERSTAR. I see. You are involved in it?

Mr. PORTER. Yes.

Mr. OBERSTAR. In that decision process—and back to the question of cost effectiveness—are you taking into consideration how many times you are going to have to come back to a site?

Mr. PORTER. Yes. That's part of it. We try to look at the big picture. If it looks like we're choosing a particular remedy that means you're going to be coming back and doing additional things, or even doing monitoring which costs money, too, we factor that in. We say that this is a walkaway solution. We talk about walkaway solutions and the ones we need to stay with for some fairly long periods of time. We consider those costs.

Mr. OBERSTAR. How many times are you going to have to walk about through Crystal City? That seems to be a long process, that one.

Another question: is your R&D department doing evaluation of various types of technology that may qualify as permanent, which you've already talked about—encapsulation, vitrification, and so on? There are vitrification technologies that have been used for nuclear waste disposal.

I talked to a European engineer in the Euradam program who said that, yes, they are vitrifying nuclear wastes and encapsulating them in steel, wrapping it in concrete, burying it in lead, and dumping it in a hole 2,000 feet in the ground. I said, "Then what do you do?" "And then we cross our fingers," he said. [Laughter.]

I don't want any crossed fingers in this program.

Mr. PORTER. Yes.

Mr. OBERSTAR. What type of—go ahead and answer the question.

Mr. PORTER. I think I am going to have Tom Devine respond to that in more detail, but we are doing assessing of a whole range of technologies including incineration, vitrification, and solidification.

Tom, why don't you respond to that a little bit in terms of what we are doing?

Mr. DEVINE. Actually, there are multiple efforts that are addressing the question that you have raised. The visible perhaps is the effort of the Office of Technology Demonstration that was established under the Superfund statute. That is a joint effort between the Office of Research and Development and the Office of Solid Waste and Emergency Response.

Within the context of that program, we are evaluating emerging technologies in a very formalized way. This is a situation where, in response to an RFP, an industry will submit to have one of their technologies tested and that technology has to at least have proceeded beyond the bench scale so that there is a pilot that one can look at.

We will provide the site for that work and we will provide the full evaluation. The developer has to pay the costs of operating the facility and getting it onto the site.

That effort is, as I say, highly formalized and follows a very standardized procedure, so that the developer, when they come onboard with us, is aware of what is going to be done and have a basis for reviewing the results, and the user community out there will know what procedures we used, will know that they had a standardized base.

The information that is resulting from this process is going to be placed into a clearinghouse that the agency is developing. We actually have the first phase of that in place today which is making use of existing systems and are in the process of designing a more involved technology clearinghouse that will handle this work plus other that is being done.

So far, there are 21 technologies that are being tested. Testing on six of those has been completed.

Mr. OBERSTAR. Will all that be on computer tape?

Mr. DEVINE. Initially no, but the proposal for the final clearinghouse does involve full, online access to a computerized database. We will take the information that is coming out of the tests that we are working on today and put it on an electronic bulletin board that we are operating that is available on a callup basis. It is not, however, what I would classify as a fully computerized database at this time because all of the information won't be available online. We are targeting that for the future.

Mr. OBERSTAR. I think it is very important to do so because I recall back 15 years ago or more in the—in fact, it was before 1972—we discovered that EPA, then the FWPCA, was issuing contracts for research on cleanup technologies which research had already been done, because they didn't have a computer bank to go into and query the bank: has this research been done?

Contractors were submitting proposals for research on work that had already been done. Once that was computerized, they were able to search the list and find, my goodness, we've already done this work; no need to revisit it and pay that money all over again.

I would hope that you would move to that kind of computerized base.

Second, do you have procedures to assure that cost estimates on technologies are reasonable and are consistent? Our information indicates that at one site, Pristine, Inc., estimates were $730 per cubic yard for incineration whereas indications are more generalized average cost is $300 per cubic yard. That's where the ROD is supposed to provide the supporting documentation and justify or explain at least the cost differentials.

Mr. **Devine**. The factors that will influence the operating costs are being documented within the testing of this new technology. However, it is very complex and site specific to specifically ascertain what the costs are going to be for destruction because of the number of variables that are involved. It's not just the type of chemical that one is dealing with. It's also the matrix on which the material is present. It's the cost that's associated with the upfront materials handling, which frequently can be very significant, and then the type of technology itself.

We will be providing information that a regional project manager or a consultant who is designing a remedy will be able to look at that technology, understand how it functions with the type of waste that it was exposed, and the matrix within which those wastes were present, that will give them a better feel for the costs that are going to be associated with that technology in full-scale operation.

Mr. **Oberstar**. When will that be available?

Mr. **Devine**. The material is coming available now. Six of the tests have already been completed. The first reports from those tests will be available in two months, and they will continue to proceed out of the system on a regular basis after that.

In addition to the Office of Technology Demonstration, there are also two other efforts that are ongoing. We have a university research program that is funded by the agency through the Office of Research and Development that is looking at a number of emerging technologies and is looking at it from the perspective of both developing new approaches and also from evaluating the effectiveness of some of the technologies that are just coming into the marketplace today, like solidification, for example, in its various forms.

The third area is in-house research. There is work that is being done within the agency itself and with its associated laboratories that is oriented toward cleanup technology, particularly in the area of groundwater remediation. We are making some very interesting discoveries that are going to have a significant impact on future designs.

Mr. **Oberstar**. Excellent. I appreciate that very much.

We will want to follow up further whether informally, perhaps preferably informally, on this matter.

Mrs. **Johnson**. I just want to thank you, Mr. Porter, for your testimony and for the work of your staff over this last year and a half. I would like to submit some questions that there isn't time to ask.

Mr. **Oberstar**. The gentlewoman from Connecticut will, by unanimous consent, have the right to submit questions.

[Questions and answers, to be supplied, follow:]

EPA RESPONSES TO SUPPLEMENTAL QUESTIONS

SUBMITTED BY REPRESENTATIVE NANCY L. JOHNSON

QUESTIONS FROM HONORABLE NANCY L. JOHNSON

Question 1: Of all actual or planned NPL deletions, how many of the sites deleted represent financially solvent, operating companies? How many represent abandoned sites? Please describe in detail EPA's criteria for deleting a site form the NPL.

Answer: Of the 33 sites planned/deleted to date, only 3 are associated with a financially solvent operating company that participated in cleanup of the site.

Sites are deleted from the NPL only after it has been determined that one or more of the following criteria have been met:

1) After consultation with the state, EPA has determined that responsible or other parties have implemented all appropriate response actions required.

2) After consultation with the state, EPA has determined that all appropriate fund-financed response under CERCLA has been implemented and that no further response by responsible parties is appropriate.

3) After consultation with the state, EPA has determined, based on a remedial investigation, that the release poses no significant threat to human health or the environment and remedial measures are not appropriate.

These deletion criteria are not intended to establish specific criteria for completion, monitoring, or performance. Site-specific completion criteria are developed in the ROD(s). These criteria are then incorporated into the design phase of response actions in the form of performance monitoring, confirmatory sampling, and operation and maintenance plans. Confirmatory sampling consists of analytical data collected during, or subsequent to, remedial action to assess whether levels of contamination at the site have been brought to within the standards identified in the ROD(s). Performance monitoring consists of the steps that are being taken to ensure that the implemented remedy is performing as designed.

Question #2: How does EPA justify keeping a financially solvent, operating company that has demonstrated its willingness and ability to comply with State and Federal environmental laws on the NPL? By refusing to remove such a company from the NPL, it is impossible for said company to obtain environmental impairment liability insurance, making it all the more difficult to complete in the marketplace, thereby greatly enhancing the probability that the site will be abandoned.

Answer: The agency is aware that operating facilities that are one the NPL find it difficult or impossible to qualify for liability insurance. However, the agency will delete sites from the NPL only when it determines that no further response is appropriate. In making this determination EPA considers the following:

(1) EPA in consultation with the State has determined that responsible or other parties have implemented all appropriate response actions required;

(2) All appropriate Fund-financed responses under CERCLA have been implemented, and EPA, in consultation with the State, has determine that no further clean up by responsible parties is appropriate; or

(3) Based on remedial investigation, EPA, in consultation with the State, has determined that the release poses no significant threat to public health or the environment, and therefore, remedial measures are not appropriate.

It is EPA's policy, published in a Policy Notice in the Federal Register on June 10, 1986, that sites which are subject to RCRA corrective action authorities could be listed on the NPL if the owners/operators were either unwilling or unable to pay for corrective action. Some RCRA sites were placed on the NPL prior to the adoption of this policy. In the June 10th notice, the agency requested information that would assist it in evaluating these RCRA facilities that are already on the NPL. After considering public comment, EPA intends to publish a policy notice explaining that the Agency does not intend to systematically review these sites for deletion from the NPL. To do so would take valuable resources away from the CERCLA program and could disrupt work that is under way.

It should be noted, however, that regardless of whether the facility is listed on the NPL, a facility with a release of hazardous waste or hazardous constituents may have difficulty obtaining environmental liability insurance before cleanup is completed since its environmental liability would be outstanding.

Question 3: Describe in detail the availability of environmental impairment liability insurance for Superfund contractors as well as Part B permit holders. What number of insured companies in each category are self-insured? What number are insured by insurance companies? Are those companies' policies currently in effect? Do they meet minimum RCRA and EPA requirements? Are such policies available to entities that are not already clients of the insurance company? Please provide the name of the company providing the insurance, policy dollar limits, policy exclusions, and dates coverage is/was in force.

Answer: EPA does not have the details of all the information that is requested here for Part B permit holders. Gathering such information would be a resource intensive effort that would create a substantial burden on State regulatory agencies, the regulated community, and EPA.

EPA is currently requesting information from a sample of over 600 owner/operators concerning their experiences in obtaining third-party liability insurance. This information is being gathered under Section 3007 of RCRA. It is intended to provide EPA a basis for making modifications to its financial responsibility regulations, found in 40 CFR Sections 264 and 265. The questionnaire asks respondents to provide information such as: the kinds of financial instruments they use to demonstrate financial responsibility for third party liability; from how many insurance companies they requested third party liability coverage; if the insurance companies agreed to offer a policy; if not what reason they gave for not doing so; if an offer of a policy was accepted or rejected by the respondent; and if rejected, why.

The results of this survey will provide the Agency valuable information as to the experience of the regulated community. The results will be shared with the Congress. The survey will not, however, provide the detailed facility and company specific information that is requested here.

Currently, two insurance companies offer pollution liability coverage to Superfund contractors. No contractors working for EPA have purchased the insurance, because EPA has not yet determined that it is "fairly and reasonably priced" (if purchased, the cost of the insurance would be passed on to EPA). None of the contractors self-insure, because EPA offers the equivalent of pollution liability insurance through its contractor indemnification clause. All Superfund contractors have that clause in their contracts. The coverage is, however, available to any response contractor cleaning up Superfund sites, and is not restricted to entities that are already clients of the insurance companies.

American International Group (AIG), through the National Union Fire Insurance Co., offers claims-made "Contractor's Environmental Impairment Liability Insurance" to all Superfund construction contractors (subject to the company's underwriting standards). For Superfund contractors, it offers limits of up to $2 million per occurrence, $2 million aggregate,with a minimum deductible of $50,000. The policy excludes all Superfund sites except for those explicitly written into the policy. AIG began offering this coverage several months ago. AIG also offers claims-made "Pollution Liability Insurance" for third party coverage for specific sites (such as RCRA sites). The policy has a maximum aggregate limit of $12.5 million, and is not available to sites proposed for or listed on the NPL.

Reliance Insurance Co., through Planet Insurance Co., offers claims-made pollution liability insurance to Superfund contractors (among others). The policy has limits of $1 million per occurrence, $2 million aggregate. Coverage is available to both construction contractors and architects/engineers, and is not limited to entities that are already clients of Reliance. This Superfund contractor coverage has been available since February 1988. Reliance also offers claims-made pollution liability insurance to treatment, storage, and disposal facilities (i.e., RCRA-type facilities), with limits of $12.5 million per occurrence and per aggregate.

Question #4: Describe EPA's new policy to begin Superfund cleanups at multi-party sites before seeking reimbursement from PRPs.

Answer: EPA has targeted a few enforcement-lead sites for funding of the remedial design only, with the expectation that private parties will both conduct the remedial action and reimburse the Fund for past expenditures; including the remedial design. This strategy will avoid delay in the initiation of response activity which may otherwise occur due to negotiation with multiple parties. This strategy will also help EPA to keep the pressure on private parties in negotiation, and should negotiations fail to achieve a settlement, EPA will be in a better position in court to clearly describe what relief is needed and the amount of a claim.

Question #5: What effect has Clean Sites, Incorporated, had on EPA's efforts under Superfund?

Answer: Clean Sites, Inc. has submitted several proposals to EPA, particularly in the area of Superfund enforcement initiatives. EPA has responded to Clean Sites and is considering all the proposals, which included expanding the scope of the Settlement Decision Committee to include review of government enforcement actions concurrently with settlement proposals; specific targets for section 106 referrals; and including specific targets and milestones in quarterly letters. EPA is maintaining a continuous dialogue with Clean Sites as well as other organizations on these and other issues.

Additionally, we are enclosing for your information an April 24, 1987 memorandum from Win Porter and Tom Adams which discusses the role of Clean Sites, Inc.

Attachment

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

APR 24 1987

MEMORANDUM

SUBJECT: Role Of Clean Sites Inc. at Superfund Sites

FROM: J. Winston Porter, Assistant Administrator
Office of Solid Waste and Emergency Response

Thomas L. Adams, Jr., Assistant Administrator
Office of Enforcement and Compliance Monitoring

TO: Addressees

1. PURPOSE

In May, 1984, Clean Sites Incorporated (CSI) was created as a not-for-profit corporation specifically with a goal to "encourage, contribute to, and bring about the cleanup of hazardous waste sites in the United States." Since that point, CSI has become involved in varying capacities at approximately 40 hazardous waste sites. CSI has demonstrated that third party entities can play an important and constructive role in expediting and improving private party cleanups of hazardous waste sites. At a number of sites, CSI has already made a significant contribution toward speeding the remedial action and resolving liability questions. Its methods have ranged from helping to identify previously unknown potentially responsible parties (PRPs) to actively "coalescing" the PRPs, to providing technical assistance, to assisting all parties (PRPs, government and community) by informal mediation. In such ways, CSI has furthered hazardous waste cleanup efforts significantly.

Experience gained from CSI's involvement at these sites has helped to clarify their role at individual sites. Based on this experience, the purpose of this memo is to provide guidance in the following areas:

- What CSI's current capabilities are;
- When CSI may participate in mediation;
- How to interact with CSI;
- Whether and how to indemnify CSI; and
- How CSI may generate revenue.

2. WHAT CSI'S CURRENT CAPABILITIES ARE

In general, CSI has the capability to participate in three areas:

- Remedial Investigation/Feasibility Study (RI/FS) Review;
- Site/Project Management; and
- Coalescing and Mediation.

CSI may, in varying capacities, engage in some or all of these activities at any specific Superfund site. CSI's activities in one area, may affect its ability to be considered for other activities as discussed herein. These services may also be useful if provided at sites where the Agency is not involved (e.g., State-lead site cleanups at non-NPL sites).

2.1 RI/FS Review

CSI has assembled technical capability to review a PRP RI/FS for consistency with the National Contingency Plan (NCP). The basic objective of CSI capability in this area is to provide a technically competent review of RI/FS technical documents in order that a better quality RI/FS is provided to EPA. Improving the potential quality of an RI/FS could lessen the need for revisions and subsequent costs and project delays, and therefore would be beneficial to the work at sites.

Amendments to Section 104(a) of CERCLA require the Agency to obtain the services of qualified parties to conduct oversight of a PRP RI/FS for EPA. One means of obtaining such services is through competitive procurement and CSI is encouraged to participate in that process. However, CSI's prior involvement at a site would be a factor in determining whether CSI could also serve as a qualified objective party at the same site.

2.2 Site/Project Management

CSI has assembled technical capability to manage a site-specific RI/FS and design and construction for both removal and remedial actions. This capability is intended to expedite site cleanup by identifying, organizing, and managing contractors in technical and remedial fields.

2.3 Mediation

The types of mediation activities in which CSI may potentially be involved are defined as follows:

Stage 1: Informal - Coalescing among PRPs and liaison activities among some or all interested parties conducted prior to formal negotiations. Most activities conducted to date by CSI fall in this category. The Agency believes that it is in this area that CSI has been particularly effective in promoting Superfund settlements and cleanups.

Stage 2: Participation In Formal Negotiations - Participation in formal negotiations with all parties as a neutral advisor/consultant, primarily to serve as a source of information. This includes substantive communications with EPA counsel or program staff regarding the settlement of enforcement cases. This does not include acting as a representative or agent for PRPs in settlement discussions, which is permitted in all cases.

Stage 3: Formal Mediation - Participation as a neutral third party in formal alternative dispute resolution proceedings, such as arbitration or mediation, pursuant to agreement by both the PRPs and the government.

Disputes concerning technical questions may arise at any of the stages of the Superfund settlement process, and CSI may also play a role in technical dispute resolution, subject to the guidelines in part 3 below.

3. WHEN CSI MAY PARTICIPATE IN MEDIATION

CSI has facilitated and may continue to facilitate waste site cleanups by performing Stage 1 activities with some or all interested parties. CSI may bring together the parties at a site, in an attempt to expedite settlement. CSI may assist in tentatively allocating costs for the site, and in resolving disputes among the parties through informal mediation.

The Agency has not pursued Stage 2 and Stage 3 activities with third parties in the Superfund program to date. We are considering implementing such activities in the future, however, and feel it is important to discuss the potential role that CSI could play.

The Office of Enforcement and Compliance Monitoring is now developing comprehensive guidance for (1) the identification of cases that are appropriate for alternative dispute resolution (ADR); (2) the evaluation of the qualifications of firms and individuals to conduct ADR, and methods by which they may be compensated; (3) the selection of appropriate ADR techniques for particular cases; and (4) procedures to be followed in each of those techniques. Among the factors included in the Agency's guidance for selection of third-party neutrals will be an organization's demonstrated experience, subject matter knowledge, independence, availability, multiple roles that could create bias, and disclosures. This guidance document has been circulated for comment.

Except for cases nominated as pilots to test the draft ADR procedures, the Agency will defer using mediators for Stages 2 and 3, until Agency guidance on the use and selection of mediators is finished, and Agency procedures to obtain such services are in place. In pilot cases nominated for mediation under the draft ADR procedures, CSI would be required to meet the qualifications for third-party neutrals set forth in those guidelines.

The Stage 1 services provided by CSI must not be confused with the more formal mediation activities contemplated for Stages 2 and 3. The ADR procedures are intended for use only where the Agency formally agrees to take part, with PRPs, in Stage 2 and 3 mediation of some contested issue. The guidelines are not intended to preclude anyone, including CSI or others, from serving in an informal intermediary role. Thus, the Stage 1 coalescing and facilitation services offered by CSI are not affected by the mediation guidelines. Technical dispute resolution performed by CSI could be an aspect of all three stages of mediation and, as such, may be subject to Agency ADR guidelines.

4. HOW TO INTERACT WITH CSI

Our experience with CSI to date indicates that they can serve a very valuable role in facilitating settlements and Superfund cleanups. Clean Sites' ability to achieve this role is predicated upon EPA's role and authority remaining unchanged regardless of CSI participation, or EPA indemnification of CSI, at individual sites. The exercise of independent judgment by Regional personnel in review and oversight of CSI work and recommendations is essential.

CSI should be treated as any third party involved at specific hazardous waste sites. Their role, if any, should be confined to those areas where CSI has particular expertise that could benefit the site-specific settlement process.

This is not to say that CSI and similar organizations should not be dealt with directly. On the contrary, CSI has facilitated and may continue to facilitate waste site cleanups by working with PRPs, government, and the community, and we should support its work insofar as possible.

The nature of Clean Sites' involvement at any particular site, as with the involvement of any third party, is left to the informed judgment of the Region. For example, if it appears that the coalescing or facilitation services of CSI may expedite settlement, the Regions should not discourage CSIs involvement.

Conversely, Regions are free to reject offers of involvement from CSI where it appears that such involvement may not be helpful or terminate CSI involvement where it is no longer helpful. Where a Region has deemed involvement by CSI to be appropriate, specific questions regarding the nature of CSI involvement have arisen in two areas:

- Information release; and
- Assessment of settlement proposals.

4.1 Information Release

Information should be furnished to CSI on the same basis on which it is furnished to members of the general public. If Clean Sites requests site-specific information beyond that which should be routinely available under the Interim CERCLA Settlement Policy (50 FR 5034) or applicable provisions of the Superfund Amendments and Reauthorization Act of 1986 (SARA), the decision on release should be based on the same factors that would be considered if a PRP steering committee made the request. Possible impacts on potential litigation should be weighed against the value of the information to PRPs in negotiating issues among themselves and in developing cleanup proposals.

4.2 Assessment of Settlement Proposals

Some settlement proposals advanced by PRPs may involve a "fair share" allocation facilitated by CSI during its coalescing efforts. Such an allocation may be a significant step in facilitating settlement. Any settlement proposal based on a "fair share" allocation must be evaluated for consistency with the EPA settlement policy, including a written assessment of the proposal in light of the ten settlement criteria. Should such an offer be accepted, the acceptance would be based entirely on the settlement policy analysis.

5. WHETHER AND HOW TO INDEMNIFY CSI

5.1 Indemnification Terms and Conditions

Congress clearly intended that entities such as CSI could have a role in the Superfund program. Entities such as CSI could organize and foster private-party cleanup initiatives at sites where private parties currently find it difficult to proceed because of the complexity of the logistical problems posed by waste site cleanup. CSI assistance should enable more sites to be cleaned up faster.

In order to pursue this worthwhile goal and because CSI assures that the full range of public and private interests would be reflected in its activities, EPA has agreed to provide limited indemnification to CSI when CSI is unable to obtain sufficient private insurance. The indemnification agreement between EPA and CSI is designed to serve as a substitute for insurance to enable CSI to undertake its goals as an independent entity. However, in no way should the agreement influence EPA's interaction with CSI, or the Agency's willingness to have CSI involved at individual sites.

EPA will continue to provide indemnification to CSI consistent with the Agency policy developed for all such agreements. Indemnification will be provided by the Agency to CSI in the following manner.

The current indemnification agreement between EPA and CSI will cover those specific sites and those specific activities at those sites, for which CSI was preauthorized, prior to October 17, 1986, the date of enactment of SARA. For sites where CSI receives indemnification after that date, the indemnification agreement will comply with §119 of SARA.

Indemnification under §119 of SARA will set forth terms and conditions including the following key provisions:

- CSI may request EPA indemnification on a site-by-site basis for work at Superfund removal and remedial actions. CSI may only request indemnification if it has used its best efforts to obtain sufficient affordable private insurance and/or PRP indemnification (except where such indemnification would create conflicts of interest or disrupt coalescing efforts).
- Indemnification may be provided for the following: CSI response action activities among government, PRPs and communities which involve coalescing the parties, assisting in communications among the parties, allocating costs among PRPs, assisting in the identification/narrowing of policy and technical disputes among the parties, and with prior approval of EPA and other involved parties, acting as a mediator in formal negotiations.

- Indemnification will not be provided for:
  CSI participation in either certification or project management of removal, RI/FS, remedial design, construction, or operation and maintenance activities, or acting as a technical advocate for or advisor to the PRPs or any other party.

Indemnification agreements will be amended further once Agency guidelines are established for use of indemnification authority under §119. These guidelines are expected in 12 to 18 months.

5.2 Site-Specific Indemnification Request Procedures

In addition to adhering to the terms and conditions of the umbrella agreement, CSI must request site-specific indemnification from EPA by written memorandum to the EPA Director of the Office of Waste Programs Enforcement (OWPE).

EPA review and approval of CSI indemnification requests will be conducted by the Director, OWPE. Among other steps in reviewing a CSI indemnification request, OWPE, through the appropriate Regional Coordinator, will immediately contact the EPA Regional CERCLA Enforcement Contact for the site, to request that the Region provide a recommendation as to whether CSI should be allowed to participate, as requested, in the response process.

Upon receipt of the OWPE request, the Regional recommendation should be forwarded to the appropriate OWPE Regional Coordinator in no later than 15 working days. At a minimum, the Regional recommendation should be based on:

- The regions judgment as to whether CSI's involvement will facilitate the settlement process;
- Potential CSI impact on Regional workload;
- Site response progress to date; and
- The impact of potential CSI participation as defined in the umbrella agreement.

OWPE review of information submitted by CSI as part of the indemnification request should be conducted concurrent with the Regional evaluation (in no more then 15 working days).

The Director, OWPE should approve or disapprove the CSI indemnification request within 10 working days from the receipt of the Regional recommendation. The Director, OWPE will notify CSI of EPA's decision by memorandum. If applicable, the memo will identify the reasons for not approving CSI's request and specify further conditions that CSI must fulfill in order to obtain EPA indemnification. There is no administrative appeal for a denial of indemnification.

If approved, the agreement will be executed pursuant to the April 29, 1985, "Site-Specific Indemnification Agreement" between CSI and EPA. The agreement verifies that CSI used its best efforts to obtain insurance and PRP indemnification. The agreement also specifies that CSI continue to use its best efforts to obtain and maintain additional insurance and indemnification coverage with respect to the site. In addition, the agreement specifies the terms and conditions by which CSI must execute its duties.

6. HOW CSI MAY GENERATE REVENUE

Questions have been raised regarding how reimbursement to CSI from PRPs for Stage 1 activities would impact CSI's neutrality. The Agency views CSI as a unique organization that strives to be independent. We feel that its actions over the past two years have confirmed its success in meeting this objective. Reimbursement by PRPs does not prevent CSI from establishing its neutrality among the PRPs if it is important to successfully accomplish Stage 1 coalescing activities. Therefore, as of October 2, 1986, CSI can begin to seek reimbursement from PRPs where it is indemnified by EPA. However, receipt of funding from PRPs for Stage 1 activities or other activities (e.g., RI/FS review), would be a factor for the Agency's consideration in determining whether CSI would be selected as a mediator for Stage 2 and 3 activities.

7. SUMMARY

Guidance related to CSI will be updated as appropriate. Questions related to the current guidance should be addressed to Bob Mason (FTS:382-4015) of the Office of Waste Programs Enforcement.

Addressees:

Regional Administrators
Regional CERCLA Division Directors
Regional Counsels
Gene Lucero, Office of Waste Programs Enforcement
Henry Longest, Office of Emergency and Remedial Response
Frank Blake, Office of General Counsel
Richard Mays, Office of Enforcement and Compliance Monitoring
Linda Fisher, Office of the Administrator

QUESTIONS FOR L. M. THOMAS

Question #6: Does the lack of uniform, consistent, tough enforcement policy penalize those "good citizen" responsible parties who voluntarily enter into settlement negotiations/agreements, while other responsible parties who remain outside the process may or may not eventually be collected from as a result of an EPA enforcement or cost recovery action? Would it be surprising, then, if many more potentially responsible parties shunned the settlement process?

Answer: The Agency is currently pursuing an aggressive enforcement strategy to avoid just such an outcome. The Agency has convened a workgroup compiling a settlement incentives policy, and is aggressively issuing administrative orders to non-settling parties.

Additionally, on May, 3, 1988, the Agency responded to a February 18, 1988 inquiry from Congressman Dingell regarding disincentives to the settlement process. Our response is attached!

Attachment

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

MAY - 3 1988

Chairman John D. Dingell
Subcommittee on Oversight and Investigations
Committee on Energy and Commerce
House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

This is in response to your letter of February 18, 1988 to Lee M. Thomas regarding the use of Section 106 authority and other disincentives against non-settlers by the Agency. Information on the following items was requested in your letter and is provided in this response:

1. Disincentives other than Section 106 judicial actions and unilateral administrative orders that the Government may apply toward non-settlers.
2. The status of the Government's enforcement actions against all non-settlers at each site where a settlement has been obtained in FY 86, FY 87, and First Quarter 1988.
3. Actions taken by the Agency to facilitate the use of Section 106 actions in appropriate cases.

1. Disincentives other than Section 106 Actions

The Agency has applied, and will continue to apply, a variety of disincentives towards recalcitrant non-settlers in appropriate circumstances. One such disincentive is the allocation of past response costs to the non-settlers followed by judicial cost recovery action to recover these costs. Cost recovery actions against non-settlers are generally brought after a remedial action is commenced; a limited cost recovery action for past costs may be brought immediately at the time of settlement.

In some cases, future response costs may be allocated to non-settlers through a mixed funding settlement. A mixed funding settlement may take any of three forms: a preauthorization settlement in which the settlers agree to conduct the full response and the Government agrees to reimburse the settlers for the non-settlers share of liability; a mixed work settlement in which the settlers conduct their share of the response action

Thomas L. Adams
04/29/88

and the Government conducts the non-settlers share of the response action; or a cash-out settlement in which the settlers pay up-front their share of the response cost and the Government conducts the full response action. We would like to note, however, that such allocations will only be used in selected situations, and that the Agency will continue to apply joint and several liability, as provided under the law to maximize private party response and cost recovery.

At some sites, response action can be divided into discrete portions which may enable settlers to conduct one portion of the remediation while leaving other portions of the work for non-settlers to conduct (or EPA as in the case of a mixed work settlement). In such cases, a Section 106 unilateral administrative order can be issued to the non-settlers to conduct the remainder of the work. In cases in which the non-settlers fail to comply with the unilateral order, a judicial referral can be prepared to enforce the order. In appropriate cases, the referral may seek penalties under Section 106(b)(1) and punitive damages under Section 107(c)(3), which if obtained by later settlement or court judgment, add significantly to the recalcitrant's cost of non-settlement or non-compliance with the order.

There are several reasons why the Agency in some cases delays or does not take enforcement actions against non-settlers. As you probably know, PRPs that are most likely to settle are generally those for which the Government has clear evidence of liability, and who are financially capable of performing the response action. Consequently, in some cases the non-settlers consist entirely of PRPs against which the Government has little likelihood of obtaining a successful judgment or who are financially incapable of satisfying the Government's claim. In some cases where existing evidence of the non-settler's liability is weak, however, enforcement action may be taken later after additional evidence (e.g., corporate records or sampling data) is obtained, rather than immediately after partial settlement with the settling PRPs.

In other cases, non-settlers may not be pursued because a complete settlement of all past and future claims was obtained leaving no remaining claims to be satisfied by the non-settlers, or because the remaining claims are considered too small to justify expenditure of the Government's resources to recover. This last decision is a difficult one and is made with careful consideration of the amount of outstanding claim, available resources, and other enforcement priorities. In some of these cases, however, the Agency has assisted settlers in contribution actions against non-settlers by providing the settlers with information or data relating to the non-settlers liability at the site.

In still other cases where settlement has been reached for the first remedial phase only, enforcement action against the non-settlers to compel implementation of the second remedial phase must wait until the remedial investigation/feasibility study (RI/FS) for the second remedial phase is completed, which may be many months after the settlement for the first phase.

2. Status of Enforcement Actions

The status of the Government's enforcement actions against all non-settlers at each site where a settlement has been obtained in FY 86, FY 87, and First Quarter 1988 is summarized in the attached series of tables. Please note that this information is considered enforcement sensitive and should not be disclosed as many of these cases are still active and release of this information may adversely affect on-going and future settlement negotiations or litigation.

As can be seen from this information, the Government has taken or is planning enforcement actions at almost all sites where viable non-settlers exist and a partial settlement has been obtained. In only a very limited number of cases has enforcement action not been taken nor planned and in these cases for justifiable reasons. Of the 33 sites with settlements for PRP conduct of remedial action, 9 sites involved settlements with all PRPs at the sites. Of the remaining 24 sites, Section 106 actions were taken or are planned at 4 sites, Section 107 actions were taken or are planned at 9 sites, and no enforcement action planned at 11 sites. In general, enforcement actions have not been taken or planned at these sites due to weak evidence of liability, lack of financial resources of the non-settlers, lack of remaining claims to pursue, or on-going or planned future negotiations (which do not preclude future enforcement actions). In addition, the Agency has taken administrative or judicial 106 actions at 11 sites where all PRPs were non-settlers, which in some cases has resulted in later complete or partial settlements. Our current initiatives are aimed at increasing the use of Section 106 actions in these situations, as well as situations where a partial settlement has been obtained.

3. Actions by the Agency to Facilitate use of Section 106 Actions

The Agency has taken a number of actions to facilitate the use of Section 106 actions in appropriate cases. Each year, the Agency establishes enforcement goals in the Superfund Comprehensive Accomplishments Plan (SCAP) and the Strategic Planning and Management System (SPMS). Targets for Section 106 actions, including both referrals and unilateral administrative orders for remedial action, as well as other enforcement activities have been established in the SCAP and are tracked on a quarterly basis. Each quarter, memoranda that identify enforcement related goals for the next quarter are sent to Regional offices. Progress toward achieving these goals is reviewed at Headquarters on a regular basis. As you noted in your letter, we are currently reviewing whether Section 106 actions are given sufficient weight in the management evaluation process in view of the Agency's difficulty in meeting this goal in the past.

To partially mitigate potential delays in clean-up caused by the lengthy time required for the preparation of Section 106 referrals and subsequent processing through the judicial system, we have made funding available to Regions for Federal Enforcement Remedial Designs (FERDs), which are Federally-funded remedial designs at enforcement-lead sites. Previously, remedial design and subsequent clean-up was delayed while the referral was being prepared and processed and judicial action sought and obtained from the court to compel private-party action. Now, remedial design can be carried out by the Government while the 106 referral for remedial action is being prepared, referred, and filed, thereby eliminating months of potential delay in starting site cleanup.

To further reduce potential delays in clean-up caused by the referral process, we have established a direct referral process whereby Regions may directly submit referrals to the Department of Justice without first being sent to Headquarters for concurrence. This process may reduce the referral process by as much as two months.

In another effort which we expect will enhance our ability to effectively prosecute Section 106 cases as well as cost recovery actions under Section 107, we have provided direct assistance to Regional offices to ensure timely compilation of good-quality administrative records to support agency clean-up decisions. Section 113(j)(1) of the Superfund Amendments and Reauthorization Act (SARA) provides that the court's review of the reasonableness of the Agency's remedy decision will be limited to the administrative record. Direct assistance to Regions was initiated last summer in the form of guidance and funding for contractor support, and is continuing to date with additional training and workshops.

In addition, we have established an incentives/disincentives workgroup composed of representatives from Headquarters, the Regions, and the Department of Justice which will focus on approaches to increasing the number of settlements while ensuring that recalcitrant non-settlers are subject to aggressive enforcement follow-up. The first workgroup meetings were held

March 11 and on April 18 and 19 in Washington. A National Superfund Enforcement Conference which will have settlement incentives and disincentives as the theme is scheduled for May 24 and 25 at EPA Region 9.

A related initiative to increase the use and timeliness of Section 106 actions is currently underway. Lee Thomas held a conference call with the Regional Administrators on April 18, 1988 to encourage the use of Section 106 actions. As part of this initiative, criteria are being developed to assist in identification of appropriate cases for Section 106 actions. Headquarters staff and management will then work with Regional personnel to identify appropriate cases for action. Once appropriate cases are identified, direct Headquarters resources will be provided to the Regions to prepare and process the 106 actions.

As the information presented here demonstrates, the Agency has established a strong record of pursuing recalcitrant non-settlers. We hope we have sufficiently addressed the questions posed in your letter, and will be happy to discuss with you the results of our current initiatives as they develop. Thank you for your support and interest in EPA's Superfund enforcement program.

Sincerely,

Win Porter

J. Winston Porter
Assistant Administrator
Office of Solid Waste
and Emergency Response

Thomas L. Adams 04/29/88
Thomas L. Adams
Assistant Administrator
Office of Enforcement
and Compliance Monitoring

Attachments

QUESTIONS FOR L. M. THOMAS

Question #7: What are the biggest barriers to reaching speedy settlements? What is the Agency doing to alleviate them? Is there anything that Congress can do? Would tougher enforcement against recalcitrants provide a greater incentive to settle?

Answer: The biggest barrier to reaching speedy settlements is the time required to negotiate issues (e.g., RD/RA negotiations, covenants not to sue, responsibility for future liability, liability for past costs and alternate remedies PRPs would rather select).

State involvement in negotiations (or the lack of) is also a common cause of delay. In some instances the state may also have problems with the remedy selected for the site. Most states operate on a different time frame in terms of concurrence and approval on consent decrees.

The major settlement incentive is the perception that settlement reduces the PRP's long run cost. If we define non-settlers as "recalcitrants", then it is obviously true that tougher enforcement against recalcitrants (by increasing the perceived expected cost of not settling) provides increased incentive to settle.

Question 7-B: What is the agency doing to alleviate them?

Answer: Headquarters, along with the Regions, is currently engaged in planning and implementing several solutions that will aid in overcoming barriers to reaching "speedy" settlements. Among these are the settlement incentives/disincentives work group. This work group is developing methods for encouraging PRPs, both cooperative and recalcitrant, to enter the settlement process.

Additionally, Headquarters has initiated a Section 106 initiative. Headquarters and the Regions have identified specific cases which have been determined to be suitable Section 106 actions. There are several options available, these include issuing Administrative Orders with delayed effective dates to use as a tool for encouraging PRPs to settle negotiations by a specific date, and "carve out" Administrative Orders that identify discrete areas of work that can be divided among both cooperative PRPs and recalcitrant PRPs once they are brought into the settlement process.

EPA's strategy is to encourage PRPs to agree to settlements wherein engineering design work can proceed upon the execution of a Consent Decree by EPA or, at least, upon lodging. There are three options to accomplish this goal. Where a complaint has not been filed, the consent decree should provide for conduct of the remedial design upon lodging of the consent decree. The consent decree should specify that certain obligations start upon lodging and should also clarify that these obligations are enforceable and that penalties will attach where there is a failure to perform. Where compliant has been filed, a stipulation for conduct of the remedial design should be filed prior to, or no later than, when the Consent Decree is lodged. Such a stipulation should be enforceable by the court. Another way which is less preferred, but may be used to accomplish this goal, is for EPA to issue an Administrative Order for remedial design.

Headquarters is also exploring the use of "flexible funding". This involves providing a pool of non-site specific money for the Regions to use as a back up in case the settlement negotiations are suddenly terminated and the case must be fund-financed or to provide available money for oversight if settlement is reached.

To aid in avoiding management delays, the assistant Administrator (AA) for Enforcement, Tom Adams, and the AA for Solid Waste and Emergency Response, Win Porter, signed a memorandum dated June 17, 1988 to delegate settlement authority in many CERCLA cases to the Regions. This removes two headquarters offices from the concurrence process and thus saves some time.

Additionally, headquarters will initiate a project management training program for RPMs and Regional attorneys. This program would establish a weighted comprehensive timeline for all aspects of the negotiation process. In this manner, parties involved in the settlement negotiation process can become more aware of the significance of even the slightest delay in the settlement process.

The office of Waste Programs Enforcement also tracks the progress of on-going Regional RD/RA negotiations. This information is provided to the Assistant Administrator for monthly and quarterly briefings. This report enables Headquarters to monitor the progress of settlements, analyze the effectiveness of special notice procedures and compliance with the moratorium. This system also allows us to insure that those sites on the "175" RA list are on schedule.

Question 7-C: Is there anything that Congress can do?

Answer: The passage of SARA provided EPA with many useful enforcement tools including joint and several liability, de minimis, mixed funding, subpoena powers to mention a few. Headquarters has provided guidance and is currently in the process of assisting the Regions in order to better implement all of the enforcement provisions in SARA. We have not identified specific legislative initiatives at this time but will work with Congress as they arise.

Question 7-D: Would tougher enforcement against recalcitrants provide a greater incentive to settle?

Answer: The Agency has a good record of enforcement against recalcitrants. The Regions were surveyed in March in response to a Congressional request for information on actions taken or planned against recalcitrants and a copy of this response was previously submitted to the House of Representatives Committee.

In addition, the Administrator of EPA has initiated a push to refer section 106 actions for sites with viable responsible parties where negotiations have been unsuccessful for the remedial action phase. This initiative is presently underway. Candidate sites are being reviewed. If PRPs do not settle, then referrals are expected in FY-88 or early FY-89.

Question 8: We understand that the Committee on Energy and Commerce has asked EPA for an update on its effort in reaching de minimis settlements. Could you please brief this subcommittee?

Answer: Yes, we would be glad to brief the subcommittee at their convenience.

Question 9: Does the agency believe that judicious and more creative use of mixed funding would accelerate remedial action at more sites by encouraging PRP's to settle for an amount closer to their pro rata share of the waste contributed? If not, why not?

Answer: The Agency believes that in certain situations mixed funding could accelerate remedial action at some sites. This, however, is dependent upon the quality of the settlement and whether mixed funding is determined to be the most effective means of promoting cleanup at a site, while ensuring the most efficient use of the Agency's resources, including the Fund. In settlement offers where mixed funding is proposed, the Agency encourages an assessment of the settlement criteria, including the strength of evidence against settlors and nonsettlors, the equities of the settlement, and the public interest.

EPA/HQ is currently undertaking a major effort to assist the Regions in implementing mixed funding. The effort encourages Regions to look to cost allocation between settlors and non-settlors. This includes both "assigning" past costs for which settling parties have been released to non-settlors and conconventional mixed funding.

Concurrent with the above activity, EPA/HQ is also in the process of developing a mixed funding training course which will be available to all Regional Enforcement staff this summer. The purpose of the course is to provide Regional staff with an understanding of mixed funding and how to implement preauthorization, cashout, and mixed work approaches. Cases where mixed funding has already been used in settlements will serve to illustrate the administrative requirements of preparing mixed funding pre-authorization proposals and pre-authorization claim requests.

Question 10: What potential liabilities remain with the responsible parties once cleanup has been accomplished pursuant to a court-approved consent decree, and delisting from the NPL occurred? Does a responsible party's release from future liability color the EPA's decision to declare that cleanup has been complete and the site delisted.

Answer: A description of the liability for such situations is in the "Interim Guidance Governing the Issuance of Covenants Not To Sue Under Section 122(f) of the Superfund Amendments and Reauthorization Act of 1986 ("SARA")" which was published in the Federal Register on July 27, 1987 [FRL-3238-7, Vol. 52, No. 143]. This guidance provides that standard reopeners for future liability will be included in all settlement agreements, with the exception of a few very limited circumstances. To date, such circumstances have occurred in only a few cases.

In no way does a potentially responsible party's release from future liability affect an EPA decision regarding the completion of site cleanup or site delisting.

Question 11: Please provide the Subcommittee with a profile of cleanups pursued by private parties and those financed from the Superfund including cost, time required for preparation of the RI/FS, estimated or actual time of completion, and cleanup technology employed.

Answer: The attached table provides a summary of cost and time for all RI/FS projects completed in FY 87. In addition, the attached Superfund Records of Decision Update provides a summary of FY 87 RODs by remedy category.

Question #12: Does the Agency have a view as to how municipalities that have contributed wastes to Superfund sites should be treated?

Answer: The Agency is in the process of developing a Municipal Settlement Policy which will address the general question of how the Agency should deal with municipalities that are potentially responsible parties (PRPs) at municipal sites (typically municipal landfills). The policy will provide guidance to the Regions on the following general questions?

-- whether municipalities should be notified as PRPs and brought into the CERCLA settlement process; and

-- if so, what settlement tools (e.g. mixed funding, de minimis settlements, and non-binding allocations of responsibility) may be available for settling with such municipalities.

The Agency has established an internal mechanism for developing the Municipal Settlement Policy -- the Municipal Settlement Workgroup which is comprised of representatives from EPA headquarters and Regional offices, the Department of Justice, and the States. The workgroup's primary function is to develop and review the Municipal Settlement Policy.

In addition, the Agency has established an ongoing mechanism for facilitating the exchange of information with groups outside of the Federal government who are interested in or affected by municipal settlements. The Agency conducted a Municipal Settlement Conference in March 1988 which included representatives from Federal, State, and local governments, local and State organizations, Congressional committees, industry, and environmental concerns. The purpose of the conference was to provide a public forum for persons to raise issues and to participate in the debate about municipal settlements. As a followup to the conference, the Agency has established a Municipal Settlement Discussion Group comprised of Federal, State, local, industry and environmental representatives. The purpose of the group is to provide a continuing forum for outside groups to raise and comment on municipal settlement issues concurrent with the Agency's development of the Municipal Settlement Policy.

Question #13: If there is a viable owner/operator and the site is in the RCRA system, should EPA require corrective action before gong after generators under Superfund?

Answer: The Agency's policy is to pursue RCRA corrective action before using Superfund. In general, it is the Agency's policy to defer placing facilities on the National Priorities List (NPL) under Superfund if they can be addressed by the corrective action authorities under RCRA. The Agency prefers to use RCRA enforcement or permitting authorities to require corrective action by the owner/operator at RCRA facilities in order to conserve CERCLA resources for sites where no financially viable owner/operator is available. There are, however, some exceptions to this. The Agency's current policy (51 FR 21054, June 10, 1986) states that facilities that are subject to corrective action under RCRA can be listed on the NPL if their Hazardous Ranking Score is greater than or equal to 28.5 and if the owner/operators are either unwilling or unable to pay for corrective action at the site. Specifically, RCRA facilities can be placed on the NPL if the agency determines that they meet one of the following criteria:

(1) The owner/operator is bankrupt;

(2) The owner/operator has lost authorization to operate and his compliance history indicates an unwillingness to perform corrective action; or

(3) The owner/operator is unwilling to perform corrective action, to be determined on a case-by-case basis.

The agency intends to publish in the near future a policy notice defining the criteria by which it will determine that an owner/operator is "unwilling" and it will solicit comments as to the criteria that should be used to determine an expanded definition of "inability" to perform corrective action. Once a facility is on the NPL, cleanup can be performed under Superfund and generators would be considered potential responsible parties.

Mr. **Oberstar**. The Chair, since a vote is in progress and we are on the second call, will suspend further questions but will submit in writing questions that we have withheld in the course of this inquiry.

This is a very important first-step look at the agency's administration of the SARA amendments to the Superfund Act, admittedly an enormous undertaking. The Chair is satisfied that this program is on the right track. Whether it is moving at the right speed, operating on the best of technologies, remains to be seen, but I see and I am encouraged today that there is certainly a will to do the right thing and a concerted effort to do the right thing and move in the right direction, and a receptiveness to constructive critique of programs, a willingness to adapt where it is necessary.

However, there are many open questions yet, and clearly the one most troubling the Chair is that of dealing with the matter of permanent removal. That's something we're going to have to labor with together for some time.

Mr. **Porter**. We want to work with you, Mr. Chairman. I think that is a very important point, and I appreciate your having the hearing. We want to work with you closely.

Mr. **Oberstar**. Thank you very much.

The subcommittee stands adjourned.

[Whereupon, at 3 p.m., the subcommittee recessed, to reconvene at the call of the Chair.]

EPA RESPONSES TO SUPPLEMENTAL QUESTIONS

SUBMITTED BY SUBCOMMITTEE CHAIRMAN JAMES L. OBERSTAR

QUESTIONS FOR EPA

Question #1: Final approval for Superfund Records of Decision rests with EPA's ten Regional Administrators. Given the complexity of individual site cleanup, what management mechanisms do you have in place to ensure consistent application of policy in all Regions and at each site?

Answer: The principle mechanism is the formal ROD delegation process under which the Assistant Administrator issues site-specific delegations of authority to sign Records of Decision to Regional Administrators. In addition, to a review of national consistency issues at the time of delegation, projects with costs greater than $30 million carry a requirement of Headquarters consultation before ROD signature. Another of the mechanisms Headquarters has had since the program's inception is staff dedicated to the oversight of remedial projects being conducted by our Regional offices. These staff members, called Regional Coordinators, are responsible for tracking progress on remedial projects from the initiation of an RI/FS through construction and deletion from the NPL and for communicating the latest developments in national policy to remedial project managers, as well as assisting in site-specific problem solving. In addition to the Regional coordination staff, Headquarters has produced several major draft guidance documents that should be available in interim final form this fall. These documents address the RI/FS process, preparation of proposed plans and records of decision, and compliance with ARARs. In addition, two training courses on the RI/FS/ROD process and ARARs, respectively are currently being offered to Regional staff. In addition to the day-to-day coordination, formal guidance and training, Regional program managers meet with Headquarters management on a quarterly basis.

Question 2: OTA'S analysis of specific RODs indicates inconsistencies within RODs, as well as between RODs, e.g. acceptance at one site, rejection at another, of a treatment technology for a similar waste. How does EPA guard against such inconsistencies?

Answer: The unique site specific characteristies of Superfund sites do not lend themselves to a direct comparison of specific technologies from site to site. Each ROD provides a site-specific rationale for rejecting or accepting a particular technology. EPA has developed nine evaluation criteria to address the statutory requirements, along with additional technical and policy considerations to be used in selecting among remedial alternatives. These criteria are balanced on a site specific basis to select an appropriate remedy. To further aid decision makers in evaluating treatment technologies, EPA develops on going ROD summary information to highlight technologies being employed at Superfund sites.

Question: 3. The General Accounting Office in its December, 1987, Report estimates that there may be as many as 425,000 hazardous sites around the country. Has EPA done any similar projections? If so, what is the agency's estimate for the potential total universe of NPL sites (not the current CERCLIS list)? On what basis was this estimate developed?

Answer: The GAO report includes nine types of sites as potential hazardous waste sites. EPA believes that CERCLIS should be used only to inventory and track Superfund activities for sites where hazardous waste has been released or is suspected to have been released. In particular, the wholesale addition of "lists", such as all mining waste sites or municipal landfills, would be an inappropriate use of limited EPA evaluation resources. We feel that the GAO estimates of potential hazardous waste sites are inaccurate according to our established guidelines for CERCLIS. Aside from estimate differences, we believe that GAO has inappropriately included the following three categories of sites as potential waste sites:

° RCRA Subtitle D facilities. Municipal landfills town dumps, and other facilities that received only household wastes were not subject to 103(c) notification requirements. Certainly while some municipal landfills may have had hazardous wastes deposited, the major portion of this category, such as non-hazardous industrial landfills, did not receive hazardous waste. Therefore these sites are not candidates from the potential universe for CERCLIS entry. Sites in this non-hazardous category account for approximately 190,000 of the facilities mentioned by GAO.

° Federal facilities. Potential hazardous waste sites at Federal facilities are almost always inventoried in CERCLIS and included on the National Priorities List (NPL) as the whole facility. GAO has counted each facility area as a potential site. Consistent accounting of sites instead of areas would reduce the GAO Federal facility estimate by approximately 4,500 sites.

° Underground injection. These wells are categorized by purpose and relative depth. The inclusion of 117,000 Class 5 wells (shallow and non-hazardous by definition) as potential hazardous wastes sites is not appropriate. These stormwater drainage wells can certainly cause bacterial contamination but would not be considered Superfund sites.

The subtraction of these inappropriate categories along with the subtraction of sites currently in CERCLIS yields a potential universe of 84,000 sites. Even with these valid categories of sites this number is the extreme estimate of all sites in the categories. We do not feel that the whole list of sites, even in valid categories, should be added to CERCLIS without suspicion of a potential problem.

In several of our Regions where we have almost eliminated our PA and SI backlog, we intend to initiate new site discovery activity. We are currently conducting an analysis of our CERCLIS and NPL data bases. This work may highlight areas (types of sites) that need additional resources for site discovery activity.

Past estimates of the potential total NPL sites were based on a proportion of the number of sites in CERCLIS. Past comparisons of the sites in CERCLIS (at that time, approximately 24,000) versus sites evaluated versus sites listed indicated a potential total of 1600-2000 NPL sites. However, it is important to note that future changes in the preremedial program, principally the revised HRS and NPL listing policies, will likely revise this percentage. Consequently, it is not possible to give an estimate of the size of the NPL at this time.

The revised HRS will include some new factors such as the consideration of potential air releases and food chain impacts. Consequently, we anticipate that different types of sites may be listed using the revised HRS. In a related area, the Agency will need to address the issue of establishing the cutoff score for the revised HRS. This may also have an impact on the number of sites listed. Over the past several years, the Agency has developed a number of NPL listing policies. Policies such as that which defers listing of RCRA sites subject to Subtitle C corrective action authorities will result in fewer of these sites listed on the NPL. The Agency is considering broadening the deferral of sites to other Federal and State authorities. These changes, if adopted, may also affect the numbers of sites listed.

Question: 4. OTA raises the question of false negative findings, i.e. hazardous sites mistakenly be dropped from the system at an early stage. Since the Agency has essentially adopted a passive role in that it inventories only sites brought to its attention, how does EPA ensure that all potentially dangerous sites are not overlooked because they are not reported?

Answer: Although there is always a statistical chance of false negative findings we feel that we minimize this possibility by using a conservative approach to our our no-further action decisions. This decision is based upon knowledge about a site (all sites must have a preliminary assessment conducted) and where information is not available, conservative, reasonable worst case assumptions are used. We also never preclude a site from reentering our system if new information indicates a mistake was made at an earlier decision point.

Question 5: Mr. Thomas, in his written testimony, stated that "We do not believe it is wise to select a remedy that cannot be implemented because of a State's inability to provide the 10% cost share, strenuous public opposition or unwillingness of the responsible parties to agree to a settlement." Does this policy not drive selection of remedy to least-cost technologies regardless of their effectiveness, and possibly in contravention of SARA's preference for permanent remedies?

Answer: State and community acceptance are only two of the nine criteria used by EPA in evaluating alternatives and selecting an appropriate remedy for a site. The nine criteria include the following:

- Short-term effectiveness
- Long-term effectiveness and permanence
- Reduction or toxicity, mobility, or volume
- Implementability
- Cost
- Compliance with ARARs
- Overall protection of human health and the environment
- State acceptance
- Community acceptance

While a specific technology may be rejected at a site due to State, community, or responsible party opposition; by balancing all criteria EPA will always select a remedy that is effective and addresses the use of permanent solutions to the maximum extent practicable.

Question #6: How does EPA guard against conflict of interest, e.g. the RI/FS contractor recommending his own company's treatment technology?

Answer: EPA's oversight responsibilities include making sure that the RI/FS contractor investigates several alternative technologies. EPA ensures that the contractor equally investigates different alternatives and presents them to EPA as options. EPA then selects the most adequate alternative.

Question 7: Does EPA have procedures to help Remedial Project Managers (RPMs) assess the reasonableness of treatment technology cost estimates, to prevent overcharging, and to assure accurate cost comparisons and selection of appropriate remedies? Please delineate the respective roles of the RPMs vis - a - vis the EPA Contract Officers (COs). How does EPA ensure that the contractor does not play its RPM against its CO?

Answer: The cost estimates for various treatment technologies which are potentially appropriate for the remediation of a Superfund site are presented within the feasibility study(FS). This study is generally performed by a contractor under the close supervision of an RPM. Because the relative costs of the various alternatives for remediation are a contributing factor towards the selection of a particular remedy, it is particularly important that the RPM believes that the estimates used are accurate and represent the current market costs. In order to achieve this, the RPM is able to draw upon a number of resources. For example, the RPM may reference readily - available engineering industry pricing guidebooks, may query other Regional or Headquarters staff regarding estimates used at similar sites, or may chose to contact industry representatives directly to obtain price quotes. Another mechanism available to the RPM is to review recent actual bid prices received for projects at other sites which involve these technologies.

Answer: The RPM is the work assignment manager under an EPA level-of-effort contract, and is responsible for directing and monitoring technical work, schedule and budget under a specific work assignment. The EPA Project Officer (PO) is responsible for all technical aspects of work performed under a specific contract and must approve work assignments, workplans and payment invoices for all work assignments. The PO and RPM are program personnel and work closely together. The CO has the signature authority for the U.S. Government; however, he/she relies on the technical judgment of the PO for appropriate actions. The PO has the overall technical contract perspective, and the PO, not the RPM, serves as liaison with the CO.

Question #9: One of the major thrusts of the 1986 Superfund Amendments and Reaauthorization Act of 1986 was to require permanent remedies wherever possible. The Office of Technology Assessment, in its analysis of selected post-SARA RODs, concludes that the technology selected at each of those sites will provide less than a permanent remedy, i.e., there is a high probability that EPA will have to return to each of these sites in the future. Can EPA assure that this will not be the case at the other sites for which RODs are being, and have been, prepared?

Answer: SARA requires the utilization of permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. All of the RODs examined by OTA selected remedies that represent the degree of permanence and treatment judged practicable for each site. While "permanent remedy" has not been strictly defined, it is often perceived as a remedy that will leave no hazardous substances behind. While the program has selected such remedies to date and will do so in the future wherever practicable, it is expected that most remedies will involve a combination of treatment and containment technologies, with treatment focused on highly toxic, highly mobile waste and containment often used to manage residuals and low concentrated waste. Such remedies will require periodic review to ensure that protection is being maintained. The program's emphasis is on selecting remedies that will provide high degrees of protection in the long-term, and satisfying the statutory preference for treatment as a principal element of remedies wherever practicable, as was done in 61% of the remedies selected for final source control action in FY'87. The Agency has issued guidance to ensure that treatment technologies are always considered as possible remedial options in the RI/FS analysis.

Question 8: Does EPA have procedures to help RPMs assess the reasonableness of contractor overhead charges?

Answer: Overhead rates are approved by the contract officer at the award of a contract. They are arrived at as a result of a formal audit process and may be revised during the course of the contract. The RPM is not responsible for approving overhead rates.

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                    RIFS DURATION AND OBLIGATIONS SUMMARY


                              TOTAL SITES: 51
                              TOTAL COST: $29,973,755.00
                              AVERAGE COST: $587,720.69
                              AVERAGE DURATION: 10.9



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                                             REMEDIAL PLANNING & ANALYSIS STAFF
                                            RIFS DURATION AND OBLIGATIONS LISTING
                                             ACTUAL STARTS TO ACTUAL COMPLETIONS


                                                     CURRENT  CURRENT
                                                     ACTUAL   ACTUAL
REGION  SITE NAME                              LEAD  START    COMPL    DURAT          OBLIG          DEOB           COST
------  ---------                              ----  -------  -------  -----          -----          ----           ----
01      OTTATI & GOSS/KINGSTON STEEL DRUM      S     041583   011687      15       937,912.        9,300.     $928,612.
        PETERSON/PURITAN, INC.                 FE    051686   052987       4       450,000.        1,860.     $448,140.
        RE-SOLVE, INC.                         F     062784   092487      13     1,256,045.       91,224.   $1,164,821.
        SACO TANNERY WASTE PITS                S     033084   090187      14       629,952.       45,612.     $584,340.
        SAVAGE MUNICIPAL WATER SUPPLY          F     121784   081087      11     2,470,000.    1,544,666.     $925,334.

** TTL_COST         $4,051,247.

   TTL_SITES      5

   AVE_COST           $810,249.

   AVE_DUR      11
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RIFS DURATION AND OBLIGATIONS LISTING
ACTUAL STARTS TO ACTUAL COMPLETIONS

REGION	SITE NAME	LEAD	CURRENT ACTUAL START	CURRENT ACTUAL COMPL	DURAT	OBLIG	DEOB	COST
02	CHEMICAL CONTROL CORPORATION	F	123184	092387	11	492,141.	731,200.	-$239,059.
	COOPER ROAD SITE	F	051487	092987	1	6,000.	182,800.	-$176,800.
	ENDICOTT VILLAGE WELL FIELD	S	032985	092587	10	697,311.	182,800.	$514,511.
	HAVILAND COMPLEX	S	032985	093087	10	699,862.	182,800.	$517,062.
	KATONAH MUNICIPAL WELL	F	062885	092587	9	1,199,000.	731,200.	$467,800.
	MONTGOMERY TOWNSHIP HOUSING DEV	S	092684	092987	12	643,434.	365 600.	$277,834.
	SUFFERN VILLAGE WELL FIELD	S	032985	092587	10	699,938.	182,800.	$517,138.
	VOLNEY MUNICIPAL LF	S	122884	073187	11	700,560.	182,800.	$517,760.
	WALDICK AEROSPACE DEVICES INC	F	041285	092987	9	845,000.	731,200.	$113,800,
	WILLIAMS PROPERTY	S	091084	093087	12	628,646.	365,600.	$263,046.

** TTL_COST $2,773,092.

TTL_SITES 10

AVE_COST $277,309.

AVE_DUR 9

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                                       RIFS DURATION AND OBLIGATIONS LISTING
                                        ACTUAL STARTS TO ACTUAL COMPLETIONS


                                                   CURRENT  CURRENT
                                                   ACTUAL   ACTUAL
REGION  SITE NAME                            LEAD  START    COMPL    DURAT          OBLIG         DEOB          COST
------  ---------                            ----  -------  -------  -----          -----         ----          ----
03      KANE & LOMBARD STREET DRUMS          F     032985   093087      10        799,593.           0.    $799,593.
        PALMERTON ZINC PILE                  F     012784   091487      14      1,138,000.     595,359.    $542,641.
        SALTVILLE WASTE DISP PONDS           F     033084   063087      13        920,000.     450,999.    $469,001.

** TTL_COST          $1,811,235

   TTL_SITES     3

   AVE_COST            $603,745

   AVE_DUR     12
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                                                 REMEDIAL PLANNING & ANALYSIS STAFF
                                                RIFS DURATION AND OBLIGATIONS LISTING
                                                 ACTUAL STARTS TO ACTUAL COMPLETIONS


                                                   CURRENT  CURRENT
                                                   ACTUAL   ACTUAL
REGION  SITE NAME                             LEAD START    COMPL    DURAT          OBLIG          DEOB           COST
------  ---------                             ---- -------  -------  -----          -----          ----           ----
04      GEIGER (C & M OIL) SITE               F    092484   060187      11     1,047,290.      525,000.      $522,290.
        INDEPENDENT MAIL CO                   F    062885   092887       9       768,990.      300,000.      $468,990.
        NEWPORT DUMP                          FE   092884   033087      10     1,000,000.      175,000.      $825,000.
        PALMETTO WOOD PRESERVING, INC         F    050185   093087       9       990,220.      225,000.      $765,220.
        POWERSVILLE LANDFILL                  FE   122884   093087      11       800,000.      400,000.      $400,000.
        TOWER CHEMICAL CO                     F    033084   060987      13     1,357,000.      225,000.    $1,132,000.

** TTL_COST         $4,113,500

  TTL_SITES     6

  AVE_COST            $685,583.

  AVE_DUR      10
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                                        RIFS DURATION AND OBLIGATIONS LISTING
                                        ACTUAL STARTS TO ACTUAL COMPLETIONS


                                         CURRENT  CURRENT
REGION  SITE NAME                        ACTUAL   ACTUAL
------  ---------                  LEAD  START    COMPL    DURAT        OBLIG          DEOB          COST
                                   ----  -------  -------  -----        -----          ----          ----
05      ENVIRO-CHEM CORP           FE    031183   092587     18    1,017,063.        5,016.   $1,012,047.
        LIQUID DISPOSAL INC        S     042283   093087     17      711,249.        1,824.     $709,425.
        MARION (BRAGG) DUMP        F     041285   093087      9      751,084.        2,280.     $748,804.
        NEW BRIGHTON / ARDEN HILL  F     022585   033187      8      744,597.       60,821.     $683,776.
        NORTHSIDE SAN LDFL         FE    022284   092587     14    1,434,100.      321,744.   $1,112,356.
        ROSE TOWNSHIP DUMP         S     082483   062287     15    1,178,848.      124,378.   $1,054,470
        SCHMALZ DUMP               F     060887   093087      1      190,000.       60,821.     $129,179.
        SEYMOUR RECYCLING CORP     FE    123083   090487     15    2,365,000       101,368.   $2,263,632.
        SOUTH POINT PLT            FE    121384   042187     10      450,000.       60,821.     $389,179.

** TTL_COST           $8,102,868.

  TTL_SITES      9

  AVE_COST             $900,319.

  AVE_DUR      11
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                                              RIFS DURATION AND OBLIGATIONS LISTING
                                               ACTUAL STARTS TO ACTUAL COMPLETIONS


                                           CURRENT  CURRENT
                                           ACTUAL   ACTUAL
REGION  SITE NAME                    LEAD  START    COMPL   DURAT        OBLIG        DEOB          COST
------  ---------                    ----  -------  ------- -----        -----        ----          ----
06      BAYOU SORRELL SITE           FE    092383   111486     13      696,000.      98,697.     $597,303.
        CLEVE REBER                  F     092383   033187     14    1,117,290.     252,780.     $864,510.
        COMPASS INDUSTRIES (AVERY DRIVE)  S  062984 092987     13      780,692.     100,800.     $679,892.
        CRYSTAL CITY AIRPORT         S     092885   092987      8    1,426,406.      40,160.   $1,386,246.
        GURLEY PIT                   F     022284   100686     11      492,819.      87,548.     $405,271.
        HARDAGE/CRINER               FE    032284   111486     11      958,000.     202,488.     $755,512.
        HIGHLANDS ACID PIT           F     032285   062687      9      170,000.      40,320.     $129,680.
        MID-SOUTH WOOD PRODUCTS      FE    092383   111486     13      739,800.     279,077.     $460,723.
        PETRO-CHEMICAL (TURTLE BAYOU) S    092684   032787     10      620,000.      10,000.     $610,000.
        SAND SPRINGS PETROCHEMICAL CMPLX S 062984   092987     13    1,209,350.      80,640.   $1,128,710.

** TTL_COST         $7,017,847.

  TTL_SITES     10

  AVE_COST            $701,785.

  AVE_DUR      11
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                                                     RIFS DURATION AND OBLIGATIONS LISTING
                                                      ACTUAL STARTS TO ACTUAL COMPLETIONS


                                                     CURRENT  CURRENT
                                                     ACTUAL   ACTUAL
REGION  SITE NAME                               LEAD START    COMPL    DURAT         OBLIG           DEOB          COST
------  ---------                               ---- -------- -------- -----         -----           ----          ----
07      CONSERVATION CHEMICAL CO                FE   080184   093087      12       50,000.             0.      $50,000.
        MINKER/STOUT/ROMAINE CREEK SITE         F    011885   092887      10       12,000.             0.      $12,000.

** TTL_COST            $62,000.

   TTL_SITES      2

   AVE_COST            $31,000.

   AVE_DUR      11
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                                                 RIFS DURATION AND OBLIGATIONS LISTING
                                                  ACTUAL STARTS TO ACTUAL COMPLETIONS


                                             CURRENT  CURRENT
                                             ACTUAL   ACTUAL
REGION  SITE NAME                      LEAD  START    COMPL    DURAT         OBLIG          DEOB          COST
------  ---------                      ----  -------  -------  -----         -----          ----          ----
08      CENTRAL CITY-CLEAR CREEK       F     021483   040987     17     2,333,723.    2,811,263.     -$477,540.
        DENVER RADIUM SITE             F     090585   092987      8       279,000.            0.      $279,000.
        ROCKY MOUNTAIN ARSENAL         FE    040485   060487      8     2,049,160.    2,015,720.       $33,440.

** TTL_COST          -$165,100.

   TTL_SITES     3

   AVE_COST           -$55,033.

   AVE_DUR      11
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                                                      OERR - HAZARDOUS SITE CONTROL DIVISION
                                                        REMEDIAL PLANNING & ANALYSIS STAFF
                                                        RIFS DURATION AND OBLIGATIONS LISTING
                                                        ACTUAL STARTS TO ACTUAL COMPLETIONS


                                                            CURRENT  CURRENT
                                                            ACTUAL   ACTUAL
REGION  SITE NAME                                     LEAD  START    COMPL    DURAT          OBLIG            DEOB            COST
------  ---------                                     ----  -------  -------  -----          -----            ----            ----
09      IRON MOUNTAIN MINE                            F     081983   100386      13     1,311,975.         13,828.     $1,298,147.
        SAN FERNANDO VALLEY (AREA 1)                  S     081685   092487       8       328,500.         13,828.       $314,672.

** TTL_COST          $1,612,819.

   TTL_SITES      2

   AVE_COST            $806,410.

   AVE_DUR     10
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                                               REMEDIAL PLANNING & ANALYSIS STAFF
                                              RIFS DURATION AND OBLIGATIONS LISTING
                                               ACTUAL STARTS TO ACTUAL COMPLETIONS


                                                   CURRENT  CURRENT
                                                   ACTUAL   ACTUAL
REGION  SITE NAME                           LEAD   START    COMPL    DURAT        OBLIG         DEOB          COST
------  ---------                           ----   -------  -------  -----        -----         ----          ----
10      MIDWAY LANDFILL                     S      032885   103186       7     864,000.     269,753.     $594,247.

** TTL_COST           $594,247.

   TTL_SITES      1

   AVE_COST           $594,247.

   AVE_DUR       7
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QUESTIONS FOR EPA

Question 10: Please provide the Committee with a percentage analysis of the various disposal methods (i.e. destruction, containment, landfills, etc) proposed under the post-SARA RODs. Please include, separately, definitions and examples of each disposal method category.

Answer: The following table provides a breakdown of source control remedies for post- SARA RODs through March 1988. In many cases more than one remedy is associated with a site.

	Total	Percentage
TREATMENT TECHNOLOGIES	55	60
o Incineration/thermal	21	23
o Solidification	8	9
o Stabilization/ neutralization	7	8
o Volatilization/aeration	4	4
o Soil washing/flushing	4	4
o Biodegradation	3	3
o Other	8	9
CONTAINMENT	35	39
o On-site containment	32	36
o Off-site disposal	3	3

The attached Superfund Records of Decision Update provide a summary of FY87 RODs by remedy category.

Question 11: Please provide the same information for hazardous material disposals under the Removal program, plus any guidance or instruction from Headquarters on the disposition of wastes under removals.

Answer: We do not currently have a data base that shows disposal methods at removal actions. We have recently pulled together some information on the use of various technology types. Attachment 1 summarizes the data. Attachment 2 is guidance on the use of alternative technology at removal actions.

Attachment 1

Number of Technologies Used at Removal Actions

Treatment	1981	1982	1983	1984	1985	1986	1987
Aeration			1	1			
Air Treatment			1	4			
Alternate Water Supply[a]					5	14	9
B.E.S.T.						1	
Blending				1	2	3	1
Capping	2	4	5	7	3	3	2
Containment[b]	3	11	10	10	12	12	8
Detonation				2		1	2
Groundwater Treatment		3	4				
Incineration[c]	13	10	12	10	30	35	14
KPEG							2
Radon Reduction System			2				
Recycling				2	3	3	3
Solidification[d]	2	4	7	17	14	1	
Temporary Storage		11*	2	4	3	13	11
Treatment[e]			1	5	16	18	8
Total Fund Financed Removal Actions[f]	28	60	129	208	196	175	254

* Data was described as "prior to 1983."

[a] Alternate water supply includes bottled water and water main hookup.

[b] Containment includes repairing berms and installing drain systems.

[c] Includes on-site and off-site incineration.

[d] Solidification is normally performed during the preprocessing stage prior to disposal.

[e] Treatment includes neutralization, oxidation, etc.

[f] Multiple technologies may have been used at an individual site.

QUESTIONS FOR EPA

Question 12: Mr. Porter [on page 172 of the transcript] offered to send a memo describing the decision process used in selecting remedies. Would you provide that for the Committee?

Answer: Attached is EPA's Interim Guidance on Superfund Selection of Remedy." and "Additional Interim Guidance for FY'87 Records of Decision."

United States
Environmental Protection
Agency

Office of
Solid Waste and
Emergency Response

EPA

DIRECTIVE NUMBER: 9355.0-19

TITLE: Interim Guidance on Superfund
Selection of Remedy

APPROVAL DATE: December 24, 1986

EFFECTIVE DATE: December 24, 1986

ORIGINATING OFFICE:

☒ **FINAL**

☐ **DRAFT**

STATUS:

REFERENCE (other documents):

OSWER OSWER OSWER
E DIRECTIVE DIRECTIVE D

EPA

United States Environmental Protection Agency
Washington, DC 20460

OSWER Directive Initiation Request

1 Directive Number
9355.0-19

2 Originator Information

Name of Contact Person	Mail Code	Office	Telephone Number
Betsy Shaw	WH-548E	OERR, HSCD	(202) 382-3304

3 Title
Interim Guidance on Superfund Selection of Remedy

4 Summary of Directive *(include brief statement of purpose)*

Provides interim guidance regarding implementation of SARA cleanup standards provisions. Highlighting new requirements and emphasis in the RI/FS and ROD process.

5 Keywords Superfund, CERCLA, Reauthorization Implementation, Remedial, SARA

6a Does this Directive Supersede Previous Directive(s)? ☐ Yes ☒ No What directive *(number, title)*

b Does It Supplement Previous Directive(s)? ☐ Yes ☒ No What Directive *(number, title)*

7 Draft Level
☒ A — Signed by AA/DAA ☐ B — Signed by Office Director ☐ C — For Review & Comment ☐ In Development

This Request Meets OSWER Directives System Format

8 Signature of Lead Office Directives Coordinator
Terry Ouverson
Date 12/30/86

9 Name and Title of Approving Official
J. Winston Porter, AA/OSWER
Date 12/24/86

OSWER OSWER OSWE
DIRECTIVE DIRECTIVE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 24 1986

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

9355.0-19

MEMORANDUM

SUBJECT: Interim Guidance on Superfund Selection of Remedy

FROM: J. Winston Porter
Assistant Administrator

TO: Regional Administrators, Regions I - X
Regional Counsel, Regions I - X
Director, Waste Management Division
Regions I, IV, V, VII, and VIII
Director, Emergency and Remedial Response Division
Region II
Director, Hazardous Wast Management Division
Regions III and VI
Director, Toxics and Waste Management Division
Region IX
Director, Hazardous Waste Division
Region X
Environmental Services Division Directors
Regions I, VI, and VII

Introduction

Section 121 of the Superfund Amendments and Reauthorization Act (SARA) addresses the cleanup standards for Superfund remedial actions. While the new statute retains the basic components of the existing Remedial Investigation/Feasibility Study (RI/FS) and Record of Decision (ROD) process, the §121 provisions add some new requirements and special emphasis to certain issues. This guidance is intended to aid Regions in selecting remedial actions pending the Agency's upcoming revision of the National Contingency Plan (NCP).

This guidance memorandum builds on the transition guidance issued October 24, 1986 ("Implementation Strategy for Reauthorized Superfund: Short Term Priorities for Action," OSWER Directive 9200.3-02) and elaborates on the guidance related to implementation of selection of remedy requirements outlined at the Superfund Implementation Meeting of November 19 - 20, 1986.

This is one of several interim guidances we plan to issue on some of the more difficult cleanup standards issues. The Selection of Remedy Workgroup, which has been meeting since July and includes representatives from Regions and States in addition to a wide variety of Headquarters offices, is currently engaged in drafting language for the NCP regulation and preamble. A number of issues related to applicable or relevant and appropriate Federal and State requirements, cost-effectiveness, and challenges associated with an increased use of treatment will be addressed.

In addition to this and subsequent interim guidances, we will attempt to meet short-term Regional implementation needs by making Headquarters staff available, upon your request, to assist your staffs as they modify their RI/FS workplans for ongoing projects in January and February, 1987. In preparation for these project review sessions, Regions in conjunction with State-lead Agencies should begin to examine ongoing projects and draft a list of potential changes that will be required to satisfy §121 of SARA. Regional staff should use this guidance and the transition guidance as the basis for proposed workplan revisions.

As soon as possible, Regions should notify potentially responsible parties (PRPs) conducting RI/FSs of the new SARA provisions and discuss with them any necessary modifications of their workplans.

We will continue to delegate remedy selection authority to Regions. In support of this effort over the longer term we will be revising the RI/FS Guidance and ROD Guidance and holding related workshops in the Spring of 1987. Also, Headquarters will be available to assist Regions with final FS revisions and ROD preparation throughout the fiscal year.

Overview of the Process

Under SARA, the remedial process retains its major analytical components: a remedial investigation (RI) in which data about site and waste characteristics, their hazards, and routes of exposure are collected and analyzed, and in which data about treatability of wastes and performance of treatment processes is assembled as necessary; and a feasibility study (FS) in which a number of potential remedial alternatives are developed and screened, and the most promising subset of alternatives is evaluated against a range of factors and compared against one another. This process culminates in the selection of a remedy.

Figure 1 suggests that the RI may need to be conducted in at least two phases, while the FS will retain the three phases described in the current NCP. The RI/FS has been evolving into a more interactive process: as the FS progresses, more sophisticated data are required to assess the feasibility of an alternative. In addition to a literature survey, more site data and/or bench- or pilot-scale testing of a treatment technology may be needed. Likewise, the RI has become a phased process wherein the data quality objectives (DQOs) are tailored to the need for additional site, waste, and treatment performance information.

While the basic framework remains intact, SARA does add some new features and emphasis. The most significant emphasis is on risk reduction through destruction or detoxification of hazardous waste by employing treatment technologies which reduce toxicity, mobility or volume rather than protection achieved through prevention of exposure. SARA calls for the Agency to prefer remedies that use treatment to permanently and significantly reduce the toxicity, mobility, or volume of wastes over remedies that do not use such treatment. In addition, SARA requires that the Agency select a remedy that utilizes permanent solutions and alternative treatment technologies, or resource recovery technologies, to the maximum extent practicable.

It should be noted that volume reduction should be considered distinctly from reducing toxicity and/or mobility; some treatment processes will increase the volume of contaminated material while effectively reducing toxicity or mobility, whereas other processes may reduce volume and consequently increase the concentration of constituents which increases the toxicity and/or mobility of the contaminants.

Another significant change is the codification of the CERCLA Compliance Policy. First published as an appendix to the preamble of the current National Contingency Plan (50 FR 47946, Wednesday, November 20, 1985), this policy required that Superfund remedial actions attain the applicable or relevant and appropriate requirements (ARARs) of other Federal environmental statutes. Furthermore, Section 300.68 of the NCP specifically refers to ARARs in regard to the development of alternatives. SARA incorporates this requirement into statutory law while adding the provision that remedial actions also attain State requirements more stringent than Federal requirements if they are also applicable or relevant and appropriate.

Also integral to the remedy selection process is SARA's incorporation, with some modifications, of the Superfund program's existing State involvement and community relations processes. The new statute basically formalizes practices the Agency has pursued and highlights the importance of early, constant, and responsive relations with both the States and communities affected by Superfund sites.

A discussion of how SARA affects each particular phase of the remedy selection process follows.

Scoping of the RI/FS

In this phase, a workplan for the RI and the FS is prepared to undertake the studies. Existing data about the site from previous investigations, including Preliminary Assessment and Site Investigation data collected for the National Priorities Listing, are assembled and evaluated. Initial project boundaries are identified, and a preliminary decision made on whether the entire site will be evaluated and remedied as a single unit or subdivided into two or more operable units.

Most significant in this phase is the preliminary identification of applicable or relevant and appropriate requirements that alternatives will need to attain. At this early stage in the process, Regions and States should begin identifying potential health-based requirements related to determining initial action levels, requirements which restrict activities that can be undertaken at different locations, (such as floodplains, wetlands, and historic sites), and on whether the requirements might be met at the completion of each operable unit or the total site remedy. Also, States should begin to identify and notify Regions of State requirements that may be potentially applicable or relevant and appropriate to the site.

Initial data quality objectives (DQOs) should also be established to ensure that environmental, health effects and treatability data will be of adequate quality and appropriate for their intended uses.

Site Characterization (RI Phase I)

This phase focuses on defining the nature and extent of contamination through field sampling and laboratory analysis to determine initial cleanup goals and to characterize waste types, mixtures, volume, the media in which they occur, concentration ranges and profiles, and interface zones between media. An analysis is conducted to characterize and assess risks, routes of exposure, fate and transport of contaminants, and likely human and environmental receptors. DQOs should be evaluated to identify data use, type, quality, and quantity. DQOs should be refined to ensure that forseeable needs for environmental, health effects, and treatability data will be met. At the completion of this stage, Regions should supply the Agency for Toxic Substances and Disease Registry with the data and analytical results.

Development of Alternatives (FS Phase I)

This stage may begin concurrently with or slightly behind the RI and consists of three major steps: identifying potential treatment technologies and their associated containment or disposal requirements; prescreening of technologies for suitability as part of alternatives, and assembling technology and/or disposal combinations into alternatives.

Treatment alternatives should be developed ranging from an alternative that, to the degree possible, would eliminate the need for long-term management (including monitoring) at the site to alternatives involving treatment that would reduce toxicity, mobility, or volume as their principal element. Although alternatives may involve different technologies (which will most often address toxicity and mobility) for different types of waste, they will vary mainly in the degree to which they rely on long-term management of treatment residuals or low-concentrated wastes.

In addition to the range of treatment alternatives, a containment option involving little or no treatment and a no action alternative should also be developed.

Initial Screening (FS Phase II)

The purpose of the screening step is to reduce the number of alternatives for further analysis while preserving a range of options. Consultation between the Agency and the State is very important at this stage. This screening is accomplished by considering the alternatives against effectiveness, implementability and cost factors. Cost is an important factor when comparing alternatives which provide similar results (i.e., cost may be used to discriminate among treatment alternatives, but not between treatment and nontreatment alternatives).

In some situations the above factors could occasionally result in elimination of alternatives which involve treatment of the source as the principal element (e.g., large, complex sites such as municipal landfills). Typically, ground water actions will be necessary at such sites to achieve adequate protection. The ROD must explain the rationale for eliminating source treatment options at this point in the process.

Innovative technologies should be carried through the screen if there is reasonable belief that they offer potential for better treatment performance or implementability, few or lesser adverse impacts than other available approaches, or lower costs than demonstrated technologies.

Post Screening Field Investigation (RI Phase II)

This phase of the RI should focus on collecting data sufficient to make a well-substantiated remedy selection decision. After a literature survey is conducted to identify existing treatment data, treatability tests at the bench- and sometimes pilot-scale may be necessary to test a particular technology on actual site waste. Additional field data may be collected as needed to further assess alternatives.

Detailed Analysis (FS Phase III)

The alternatives passing through the initial screen should be analyzed in further detail against a range of factors and compared against one another.

The effectiveness of the alternatives should be assessed, taking into account whether or not an alternative adequately protects human health and the environment and attains Federal and State ARARs, whether or not it significantly and permanently reduces the toxicity, mobility, or volume of hazardous constituents, and whether or not it is technically reliable.

Alternatives should be evaluated against implementability factors, including the technical feasibility and availability of the technologies each alternative would employ, the technical and institutional ability to monitor, maintain, and replace technologies over time; and the administrative feasibility ot implementing the alternative.

Finally, the costs of construction and the long-term costs of operating and maintaining the alternatives should be analyzed using present-worth analysis.

Both the short- and long-term effects of each of these factors must be assessed. In considering these items, Regions will address all of the long-term effectiveness factors cited in SARA §121(b)(1). After each alternative has been analyzed against these factors, the remedial options should be compared for their relative strengths and weaknesses.

Upon completion of the RI and draft FS, EPA and the State should formulate a recommended alternative or approach to present to the community when the FS goes out for public comment. At this point, the RI/FS is transmitted to ATSDR for their use in preparing a health assessment.

Selection of Remedy

The remedial action for a site should be selected among those alternatives about which the following four findings can be made:

- Remedies must be protective of human health and the environment. This means that the remedy meets or exceeds ARARs or health-based levels established through a risk assessment when ARARs do not exist.

- Remedies should attain Federal and State public health and environmental requirements that have been identified for a specific site. In general, the remedy selection process presumes that alternatives will be formulated and refined to ensure that they attain all of the appropriate ARARs. However, SARA does provide waivers which permit selection of remedies which do not attain all ARARs under six different types of circumstances: fund-balancing, technical impracticability, interim remedy, greater risk to health and the environment, equivalent standard of performance, and inconsistent application of State standards. If a remedy is protective, cost-effective, and [illegible] statutory preferences, [illegible] will not necessarily [illegible] if it was viewed as the [illegible] alternative.

- Remedies must be cost-effective. In general, this finding requires ensuring that the results of a particular alternative cannot be achieved by less costly methods. This implies that for any specific site there may be more than one cost-effective remedy, with each remedy varying in its environmental and public health results.

- Remedies must utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. This determination is interrelated to the cost-effectiveness finding and includes consideration of technological feasibility and availability.

The selected remedy should represent the best balance across all the effectiveness, implementability, and cost factors examined in the detailed analysis. In making this selection, the decision-maker must consider the statutory preference for treatment which permanently and significantly reduces the toxicity, mobility or volume of the waste.

The program permits the staging of remedial action implementation through multiple operable units. Decisionmakers may choose to implement a limited measure to stabilize a site when a suitable technology for that site is not currently available but clearly on the horizon or capacity for the desired technology is currently unavailable. Initial cleanup actions should not impede implementation of subsequent phases.

Writing the ROD

The Record of Decision (declaration statement and supporting documentation) is the centerpiece of the administrative record against which the Agency's decisionmaking may be judged by the courts. In addition to containing an accurate and complete summary of the site, the threat it poses, and the selected remedy, the ROD must describe the relative strengths and weaknesses of each alternative considered and offer a clear justification for the final decision that is made. For Fund-financed actions, the ROD should include a formal written concurrence from the State.

Specific statements and explanations that should appear in the ROD include the following:

- A statement and justification that the selected remedy is protective and cost-effective, attains ARARs and utilizes permanent solutions and treatment technologies to the maximum extent practicable, where all statutory requirements and preferences are fully satisfied.
- An explanation as to why an alternative that would have reduced the toxicity, mobility, or volume of waste was not selected if the selected remedy does not satisfy the preference for permanent solutions.
- A statement that indicates whether a remedy which does not satisfy the statutory preferences for treatment is intended as the final remedy for that site (at a minimum this remedy would have to be protective and cost-effective) or whether the action is an operable unit that will be followed by subsequent actions to achieve a final remedy which satisfies the preferences. The timeframe for completing the total remedy should be specified.
- A description of those Federal and State requirements which were found to be applicable or relevant and appropriate to the site and will be met. In addition, where ARARs do not exist, a description of the health-based level that will be met.
- A statement of which ARARs will not be met and the waiver that will be invoked to justify the nonattainment.
- In those occasional situations where no treatment alternative was carried through the screen to the detailed analysis (for sites such as municipal landfills) a special explanation should be included in the ROD.

Decisionmakers have some flexibility as to how specific the ROD is regarding the use of treatment technologies. At a minimum, the ROD should state what technology will be applied to what type and amount of waste and the performance goal that process is expected to reach. For instance, the ROD may state that thermal destruction is the selected remedy. However, the effectiveness, implementability, and cost analyses must be based on a specific process within that technology category, such as rotary kiln, to ground the analysis in hard data. When the remedial action is bid, any process in that technology category stated in the ROD would be eligible provided they could match the performance goals of the process analyzed in detail.

Applicability to Ongoing Projects

Superfund reauthorization affects a wide variety of projects in many different stages of development. The cleanup standards provisions in §121 will affect ongoing projects in a particularly unique way. For projects closest to ROD signature, Regional managers and project managers should focus on whether an adequate range of treatment alternatives was considered for feasibility, and whether Federal and particularly State ARARs have been thoroughly considered and will be met, unless a waiver is to be invoked. If there is a sound basis for selecting and rejecting alternatives under the new statutory requirements and preferences, Regions should proceed to ROD signature and may postpone treatability studies (that would otherwise be conducted in the RI/FS) until remedial design.

[illegible] other hand, projects in their early stages should be [illegible] be consistent with the process outlined in this [illegible] particular, Regions should assess the need for [illegible] testing and initiate immediately studies necessary [illegible] availability of needed data in the detailed analysis [illegible]

Ground Water Operable Units

With the exception of specific statements in §121(d)(2)(A)(ii) and §121(d)(2)(B)(i) and (ii), the cleanup standards provisions apply most directly to source control measures. The existing approach toward ground water remediation outlined in the "Draft Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites (September 29, 1986)" remains largely intact with some modifications necessary to conform to SARA requirements related to ARARs. Specific guidance on ARARs, including MCLGs and WQC, will be provided in the near future.

The remedial approach outlined in the Draft Guidance derives directly from EPA's Ground Water Protection Strategy, which states that ground waters should be protected differentially based on characteristics of vulnerability, use and value. Superfund's Draft Guidance calls for the development of a limited number of ground water remedial alternatives within a performance range, defined in terms of different remediation levels (the level of ground water contaminant reduction achieved), and different rates of restoration (the time required to achieve remediation levels).

Factors that influence a decision regarding the appropriate rate of restoration are:

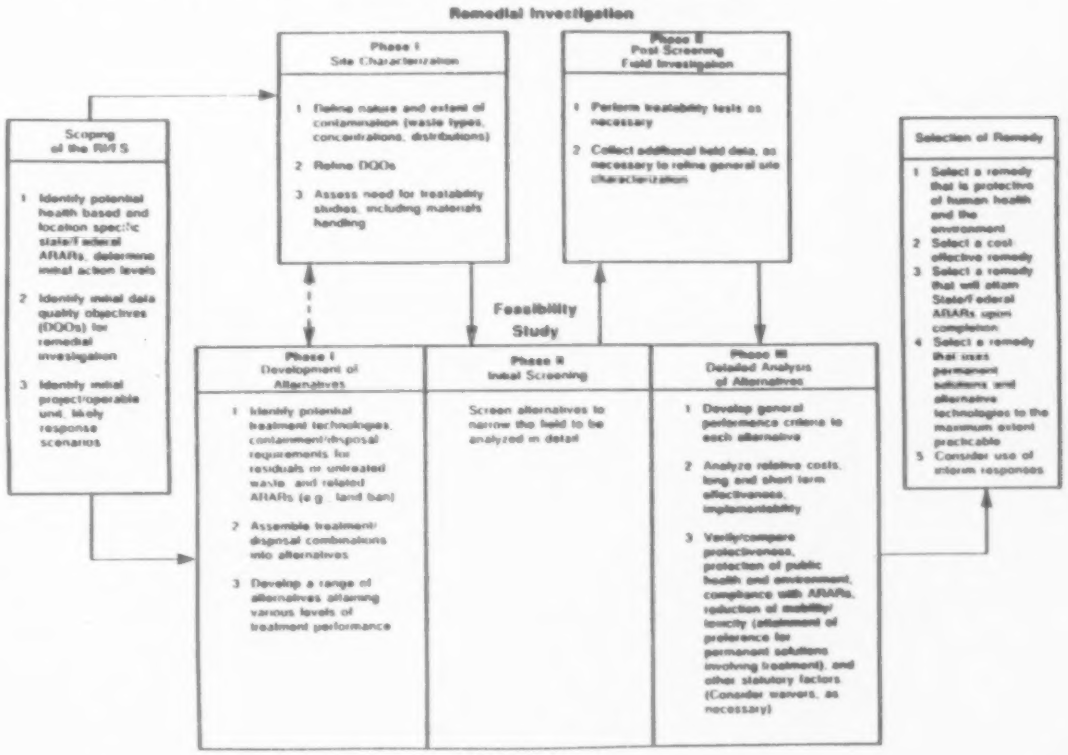
- Feasibility of providing an alternative water supply;
- Current use of ground water;
- Potential need for ground water;
- Effectiveness and reliability of institutional controls;
- Ability to monitor and control the movement of contaminants in ground water;
- Other risks borne by the affected population; and
- Population sensitivities.

Additionally, limiting the extent of contamination, the impact of contamination on environmental receptors, the technical practicability and the cost of alternatives should also be analyzed and factored into the decision-making process.

Should you have any questions concerning this guidance, please contact Bill Hanson (FTS 382-2345) in the Hazardous Site Control Division or John Cross (FTS 475-6770) in the CERCLA Enforcement Division.

Figure 1

Proposed Remedy Selection Process Under Reauthorization


Remedial Investigation
Scoping of the RI/FS
1 Identify potential health based and location specific state/Federal ARARs, determine initial action levels
2 Identify initial data quality objectives (DQOs) for remedial investigation
3 Identify initial project/operable unit, likely response scenarios
Phase I Site Characterization
1 Refine nature and extent of contamination (waste types, concentrations, distributions)
2 Refine DQOs
3 Assess need for treatability studies, including materials handling
Phase II Post Screening Field Investigation
1 Perform treatability tests as necessary
2 Collect additional field data, as necessary to refine general site characterization
Feasibility Study
Phase I Development of Alternatives
1 Identify potential treatment technologies, containment/disposal requirements for residuals or untreated waste, and related ARARs (e.g., land ban)
2 Assemble treatment/disposal combinations into alternatives
3 Develop a range of alternatives attaining various levels of treatment performance
Phase II Initial Screening
Screen alternatives to narrow the field to be analyzed in detail
Phase III Detailed Analysis of Alternatives
1 Develop general performance criteria to each alternative
2 Analyze relative costs, long and short term effectiveness, implementability
3 Verify/compare protectiveness, protection of public health and environment, compliance with ARARs, reduction of mobility/toxicity (attainment of preference for permanent solutions involving treatment), and other statutory factors (Consider waivers, as necessary)
Selection of Remedy
1 Select a remedy that is protective of human health and the environment
2 Select a cost effective remedy
3 Select a remedy that will attain State/Federal ARARs upon completion
4 Select a remedy that uses permanent solutions and alternative technologies to the maximum extent practicable
5 Consider use of interim responses

United States
Environmental Protection
Agency

Office of
Solid Waste and
Emergency Response

EPA

DIRECTIVE NUMBER: 9355.0-21

TITLE: Additional Interim Guidance for FY'87 Records of Decision

APPROVAL DATE: July 24, 1987

EFFECTIVE DATE: July 24, 1987

ORIGINATING OFFICE: OERR/HSCD

☑ **FINAL**

☐ **DRAFT**

STATUS:

REFERENCE (other documents):
Supplements 9355.0-19

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DIRECTIVE DIRECTIVE DI

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 24 1987

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Additional Interim Guidance for FY'87 Records of Decision

FROM: J. Winston Porter
Assistant Administrator

TO: Director, Waste Management Division
Regions I, IV, V, VII, and VIII
Director, Air and Waste Management Division
Region II
Director, Hazardous Waste Management Division
Regions III and VI
Director, Toxics and Waste Management Division
Region IX
Director, Hazardous Waste Division
Region X

There are a large number of Records of Decision (RODs) to be signed by the Regions in the near term. This interim guidance memorandum is meant to assist you with making and documenting these decisions.

Records of Decision in FY'87 are governed by the current National Contingency Plan (NCP) promulgated November 20, 1985 and the Superfund Amendments and Reauthorization Act of 1986 (SARA). This memorandum supplements the "Interim Guidance on Superfund Selection of Remedy" issued December 24, 1986 which was an early effort to explain how SARA modifies the processes and procedures established in the NCP. Pending revisions to the NCP and the guidances on "Remedial Investigations (RI)," "Feasibility Studies (FS)," and "Preparation of Decision Documents (ROD Guidance)" planned for next fiscal year, Regions should follow this and the previous guidance memorandum to the extent practicable.

In brief, the remedy selection process consists of the collection of data on site and waste characteristics and the analysis of alternative approaches for remediating identified problems. The results of the analysis are then assembled to assist decisionmakers in determining what remedy is most appropriate for a given site. The remedy selection occurs in two steps: first, a proposed plan is issued with the RI/FS for public comment; based upon consideration of the comments and any new information received, the Agency then makes a final remedy selection which is explained in a Record of Decision.

In both the Proposed Plan and Record of Decision it is important to discuss and compare the alternatives in terms of specific evaluation criteria. Attachment #1 lists some of the most important criteria that should be considered in this analysis. As indicated, many of the criteria are specifically mandated by SARA; others derive from the current NCP and existing RI/FS and ROD guidances. Suggested component measures of each criteria are listed, although different measures may be more or less appropriate for an individual site.

The evaluation criteria will also be referenced in explaining the rationale for selecting the chosen alternative in the Record of Decision. The RODs must also make four statutory findings about the selected remedy:

1. That the remedy is protective of human health and the environment;
2. That the remedy attains the legally applicable or relevant and appropriate requirements of other Federal and State public health or environmental laws, or provides the grounds for invoking one of the six waivers provided for in SARA;
3. That the remedy is cost-effective; and
4. That the remedy utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

Additionally, the ROD should explain whether or not the remedy satisfies the statutory preference for remedies which employ treatment which permanently and significantly reduces the toxicity, mobility or volume of hazardous substances as their principal element. To promote consistency in how this documentation is organized, Attachment #2 provides an outline of the various components of ROD and their suggested sequence. A more detailed version of this proposed outline will be presented in the aforementioned ROD Guidance due out this fall.

It is hoped that this guidance will help you focus on the considerations which are most significant for the preparation of RODs this fiscal year. Recognizing that some projects are near completion, you will need to determine the extent to which these considerations can be incorporated into decision documents not yet signed on a case by case basis. Some key remedy selection issues are still under discussion and will be resolved through the process of finalizing proposed revisions to the NCP.

Attachments

ATTACHMENT #1

CRITERIA FOR EVALUATING ALTERNATIVES

Listed below are the key criteria which should be considered in evaluating and comparing alternatives. Those criteria which relate directly to the factors SARA §121(b)(1)(A - G) mandates the Agency to assess are marked. A key listing the associated statutory factors is provided. Records of Decision must address these statutory factors; this can be accomplished by referencing or footnoting the factors in summarizing the analysis of alternatives against the nine criteria below.

1. Compliance with ARARs

Alternatives should be assessed as to whether they attain legally applicable or relevant and appropriate requirements of other Federal and State environmental and public health laws, including, as appropriate:

- ° Contaminant-specific ARARs (e.g., MCLs, NAAQs)[B]
- ° Location-specific ARARs (e.g., restrictions on actions at historic preservation sites)[B]
- ° Action-specific ARARs (e.g., RCRA requirements for incineration and closure)[B]

SARA provides six waivers for situations where not all ARARs can be met in §121(d)(4). Use of waivers must be justified in the ROD.

2. Reduction of Toxicity, Mobility or Volume

The degree to which alternatives employ treatment that reduces toxicity, mobility, or volume should be assessed. Factors that might be relevant include:

- ° The treatment processes the remedies employ and materials they will treat;
- ° The amount of hazardous materials that will be destroyed or treated;
- ° The degree of expected reduction in toxicity, mobility or volume;[B]
- ° The degree to which the treatment is irreversible;
- ° The residuals that will remain following treatment, considering the persistence, toxicity, mobility, and propensity to bioaccumulate of such hazardous substances and their constituents.[C]

3. Short-Term Effectiveness

The short-term effectiveness of alternatives should be assessed considering appropriate factors among the following:

- Magnitude of reduction of existing risks;
- Short-term risks that might be posed to the community, workers, or the environment during implementation of an alternative including potential threats to human health and the environment associated with excavation, transportation, and redisposal or containment;[D,G]
- Time until full protection is achieved.

4. Long-term Effectiveness and Permanence

Alternatives should be assessed for the long-term effectiveness and permanence they afford along with the degree of certainty that the remedy will prove successful. Factors which might be considered are:

- Magnitude of residual risks in terms of amounts and concentrations of waste remaining following implementation of a remedial action, considering the persistence, toxicity, mobility, and propensity to bioaccumulate of such hazardous substances and their constituents;[A,B,C,G]
- Type and degree of long-term management required, including monitoring and operation and maintenance;[A,B,G]
- Potential for exposure of human and environmental receptors to remaining waste considering the potential threat to human health and the environment associated with excavation, transportation, redisposal, or containment;[D,G]
- Long-term reliability of the engineering and institutional controls, including uncertainties associated with land disposal of untreated wastes and residuals;[A,B,F,G]
- Potential need for replacement of the remedy.[F]

5. Implementability

The ease or difficulty of implementing the alternatives can be assessed by considering the following types of factors:

- Degree of difficulty associated with constructing the technology;
- Expected operational reliability of the technologies;
- Need to coordinate with and obtain necessary approvals and permits (e.g., NPDES, Dredge and Fill Permits for off-site actions) from other offices and agencies;
- Availability of necessary equipment and specialists;
- Available capacity and location of needed treatment, storage, and disposal services.
- Need to respond to other sites (§104 actions only).

6. Cost

The types of costs that should be assessed include the following:

- Capital costs;
- Operation and maintenance costs;[E]
- Costs of five year reviews, where required;
- Net present value of captial and O & M costs;[E]
- Potential future remedial action costs.[F]

7. Community Acceptance

Clearly, a full assessment of community attitudes toward the alternatives cannot be made until the formal public comment period on the proposed plan and RI/FS has been held. Earlier readings of community acceptance of and preferences among the alternatives will depend on the degree and type of community involvement in a project during the RI/FS process. This assessment should look at:

- Components of the alternatives that the community supports;
- Features of the alternatives about which the community has reservations;
- Elements of the alternatives which the community strongly opposes.

8. State Acceptance

States are joint risk managers with EPA in the Superfund process, often taking the lead for remedial investigations and feasibility studies, sharing costs of the remedial actions, and paying for the operation and maintenance of the remedies. Because of close interaction throughout remedial projects, it may not be necessary to address State concerns with proposed alternatives as a specific evaluation criterion when comparing alternatives. In some cases, however, it may be appropriate to consider incorporating such concerns into the evaluation with regard to:

- Components of the alternatives the State supports;
- Features of the alternatives about which the State has reservations;
- Elements of the alternatives under consideration that the State strongly opposes.

9. Overall Protection of Human Health and the Environment

Following the analysis of remedial options against individual evaluation criteria, the alternatives should be assessed from the standpoint of whether they provide adequate protection of human health and the environment considering the multiple criteria.

KEY

(Section 121(b)(1)(A - G) Factors)

A = the long-term uncertainties associated with land disposal

B = the goals, objectives, and requirements of the Solid Waste Disposal Act

C = the persistence, toxicity, mobility, and propensity to bioaccumulate of such hazardous substances and their constituents

D = short- and long-term potential for adverse health effects from human exposure

E = long-term maintenance costs

F = the potential for future remedial action costs if the alternative remedial action in question were to fail

G = the potential threat to human health and the environment associated with excavation, transportation, and redisposal, or containment

ATTACHMENT #2

SUGGESTED OUTLINE FOR RECORDS OF DECISION

I. DECLARATION

   A. Site Name and Location

   B. Statement of Basis and Purpose (attach Index to Administrative Record)

   C. Description of the Selected Remedy

   D. Declarations of consistency with CERCLA as amended by SARA and the NCP (attach letter of State concurrence)

II. DECISION SUMMARY

   A. Site Name, Location and Description

   B. Site History

   C. Enforcement History

   D. Community Relations History

   * E. Alternatives Evaluation

   ** F. Selected Remedy (Description and rationale for selection)

III. Responsiveness Summary

   A. Overview

   B. Background on Community Involvement

   C. Summary of Public Comments and Agency Responses

   D. Explanation of Differences Between Proposed Plan and Selected Remedy (if appropriate)

   E. Remaining Concerns

   F. Attachment listing community relations activities conducted at the site prior to and during the public comment period.

* Denotes section where analysis of alternatives against evaluation criteria will be documented (See Attachment #2).

** Indicates section where statutory findings will be discussed.

QUESTIONS FOR EPA

Queston 13: Would you provide the curriculum for the Superfund Remedial Project Manager certification program and the contractor training sessions described by Mr. Porter (on page 189 of the transcript).

Answer: Attached is a proposed curriculum for On-Scene Coordinators (OSCs) and Remedial Project Managers (RPMs). Regional personnel are currently reviewing it to determine whether additional courses are needed. Also attached is the most recent OSWER Training Course Catalog, which describes the current course offerings.

DRAFT

OSC/RPM SUPPORT PROGRAM CURRICULUM

OSC/RPM PROGRAM OPERATIONS

OSC/RPM Authorities, Roles and Responsiblities
RI/FS Course
ARARS Course
Cooperative Agreements Oversight
Removal Operations
Community Relations

ADMINISTRATION

Project Officer Certification
Contracts Administration
Grants & Cooperative Agreements

FUNDAMENTALS

Mathematical Modeling and Optimization
Geophysics for Non-Geophysicians
Engineering for Non-Engineers
Ground-water Concepts for Non-Hydrogeologists
Negotiating
Community Relations
Communication Skills
Communication for Scientists
Title III
Contingency Planning
Hazard Analysis
Emergency Response Operations

SAFETY AND HEALTH

Stress Management
Risk Assessment Course
Personal Risk and Safety
Hazardous Materials Incident Response Operations
Response Safety Decision Making

PROJECT MANAGEMENT

Basic Project Management
Computer Applications
Construction Management
Advanced Project Management
Strategic Planning
Time Management

TECHNOLOGY

Ground-water Fate and Transport
Well Technology
X-Ray Fluorescence
Advanced Geophysics
Incineration
Land Disposal
ERT Course Series

OSC/RPM INSTITUTE CASE STUDIES

Pump and Treat
Site Characterization
Soils Stabilization
Creosote
Expert Testimony
Project Management

United States
Environmental Protection
Agency

Office of
Solid Waste
and Emergency
Response

Spring 1988

OSWER

Training Course Catalogue

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INTRODUCTION

Management and Operation

Courses included in the catalogue are conducted under the technical direction of the Office of Program Management and Office of Solid Waste and Emergency Response (OSWER) of the U.S. Environmental Protection Agency (EPA). An important function of OPMT is to coordinate the technical training needs of EPA employees involved in programs pertaining to hazardous waste. Course procurement and delivery to meet these training needs has been provided through contracts funded through OSWER.

Program and Regional Training Contracts

Training representatives of the OSWER Program Offices and the U.S. EPA Regional Offices who may be able to provide technical assistance and information on OSWER training courses include:

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Using the OSWER Training Course Catalogue

This catalogue offers descriptions of OSWER training courses that are currently available or are expected to be offered in the future. The catalogue is best used in conjunction with the OSWER Training Calendar, which is issued on an annual basis and updated quarterly. It is distributed to all EPA Regions and by request.

To request the annual OSWER Training Calendar or quarterly updates contact:

Camille Lee
Office of Solid Waste and Emergency Response
U.S. EPA (WH 562 A)
401 M Street, S.W., Room 3603
Washington, D.C. 20460
Phone: FTS: 8-382-4506
DD: (202) 382-4506

The OSWER Training Calendar may be consulted to obtain information on OSWER training courses that are currently scheduled to be delivered. Additional scheduling information may also be obtained by calling the contact person, whose name and number are found after each course description.

The course descriptions are organized by category and by Program Office. Consult the Table of Contents to identify and locate the different categories of OSWER training courses.

REGISTRATION

Application for Courses

Applications for all OSWER training courses must be submitted to the contact person for each particular course. Application may be accomplished by calling the contact person and registering over the telephone, by submitting a course registration form, or by submitting an SF 182 Form to the contact person. The course registration form, which is located at the back of the catalogue, may be photocopied if additional forms are needed.

To register for the Office of Emergency and Remedial Response (OERR), Enviromental Response Branch training courses (those that have a course number), contact the OERR Registrar at:

U.S. Environmental Protection Agency
26 West Martin Luther King Blvd.
Cincinnati, OH 45268
Phone: FTS: 8-684-7537
DD: (513) 569-7537

Approval and Confirmation of Application

Approval of applications to OSWER training courses is the responsibility of the contact person for each particular course. Some courses may require applicants to possess specific experience or qualifications in order to attend the course.

Applicants judged to be fully qualified are approved immediately upon review of the application, provided space is available. Applicants considered less than fully qualified, or those whose approval would make class enrollment exceed established ceilings, may be placed on a "wait" list with final decision on acceptance for enrollment deferred until a time specified by the contact person.

Confirmation of attendance is required prior to the course delivery. Notice of confirmation is made by the contact person and may be either by letter or telephone.

Cancellations/Substitutions

If unable to attend a course for which you are registered, please notify the course contact person either by phone or in writing as soon as possible. OSWER training courses often have waiting lists and failure to cancel in advance means that another qualified applicant will not be able to attend the course. Substitutions are at the discretion of the course contact person.

Travel and Lodging

Students are responsible for their own travel arrangements and lodging. The course contact person may be able to provide information on local lodging, as well as course start and ending times.

MANAGEMENT AND ADMINISTRATIVE

Basics of Program/Project Management

2 Days

This comprehensive course covers various types of project management organization and the procedures necessary to plan, organize, staff, direct and control projects in research, development, production, services or construction. Because many program/project managers possess technical expertise but frequently lack management training, part of the first session will be devoted to a review of the general principles of traditional management. The course material is compatible with current Federal regulations, directives, and practices.

Contact: **Registrar:** (800) 451-8161

Contract Administration Training for Project Officers

3 1/2 Days

The Contract Administration course provides the student with a review of the pre-award phase of the contract acquisition cycle. The course begins with a description of a contract and a discussion of the authority of individuals involved in the acquisition process. Other topics include review of the development of a statement of work, preparation of an independent cost estimate, and the development of technical evaluation criteria. The course is presented using lecture and discussion.

Contact: **Shirley Green** FTS: 8-382-2594
DD: (202) 382-2594

Contract Project Officers Certification Course

3 Days

This three day training course is designed to provide EPA Project Officers, Work Assignment Managers, and Delivery Order Officers with a better understanding of the contract administration process. The course is presented using lectures, video tapes and class discussions. This course is mandatory to meet certification requirements for EPA project officers.

Contact: **Shirley Green** FTS: 8-382-2594
DD: (202) 382-2594

Funds Certifying Officer Training

2 Days

This course covers all aspects of funds control procedures at the Allowance Holder/Responsibility Center level. Topics to be covered include an overview of the agency-wide process, laws and policies, roles and responsibilities, manual procedures for keeping a document control register, and automated systems for achieving funds control.

This course is designed for all individuals who maintain document control registers and/or who certify funds availability for an Allowance Holder or Responsibility Center.

Contact: Shirley Green FTS: 8-382-2594
DD: (202) 382-2594

Introduction to Procurement Under Superfund

3 Days

This three-day course includes discussions on procurement planning, procurement types, justification, and evaluation criteria; contract types, contract negotiations, Federal grant and procurement regulations, contract modifications, administration, and monitoring. This course is directed to State audiences and does not meet agency-wide requirements for project officer certification.

Contact: Registrar: (800) 451-8161

Regional Workshop in Contracts and IAG Administration

The target audience for this course includes Regional and Headquarters Work Assignment Managers and/or Site Managers (RPM's) who will be directing contractors to conduct enforcement activities and track expenditures. The course will cover OWPE Contract Administration roles and responsibilities, work assignment processes (forms, plans), monthly progress reviews and cost reports, and quality assurance duties, using experts and consultants.

Contact: Julie A. Klass FTS: 8-475-9831
DD: (202) 475-9831

Superfund Response Agreements Training

2 Days

This course offers an overview of cooperative agreements and is primarily intended for regional grants and financial management officials. The course will include discussion on the development and review of cooperative agreement applications. The course will also cover fiscal, program and grants administration, and management of cooperative agreements.

Contact: Jan Wine FTS: 8-382-2455
DD: (202) 382-2455

Training for Project Officers of Grants and Cooperative Agreements

2 Days

This 16-hour program is designed to provide each participant with a better understanding of the assistance process and the project officer's critical role as part of the assistance team from inception of the process through closeout.

The course, developed by members of the Grants Administration Division, is presented through a combination of lecture and student participation. The Assistance Administration Manual is referenced throughout. Overheads are used by the presenters and there are several handouts.

Participants, whether an experienced or new project officer, will better understand the assistance process and their role as a part of the assistance team.

Contact: Shirley Green FTS: 8-382-2594
DD:(202) 382-2594

SAFETY

Hazardous Materials Incident Response Operations (165.5)

5 Days

This course provides attendees with practical knowledge concerning incident response operations. The course focuses on the response team function, methods, procedures, and safety in responding to hazardous substances spills or abandoned waste sites. Approximately 1/3 of the course is classroom instruction. The remaining time is hands-on use of monitoring equipment, personnel protective apparatus, and other applications of classroom topics. After completing the course, attendees should be more familiar with selection, use, and limitation of respiratory protection apparatus and protective clothing; site entry, control, and decontamination procedures; the use of field monitoring instruments; and response organization and management.

Segments of this course require the wearing of respiratory equipment which precludes the use of glasses. Portions of this course and 165.2 are redundant. Persons considering application to both courses should confer with the Registrar.

Continuing Education Units: 2.7

Contact:	Registrar	FTS:	8-684-7537
		DD:	(513) 569-7537

Personnel Protection and Safety (165.2)

5 Days

This course is for relatively inexperienced personnel who respond to accidents involving hazardous substances or who investigate uncontrolled hazardous waste sites. Course topics include: the fundamentals of respiratory protection; types of respiratory protection apparatuses; use and limitation of equipment; selection of respiratory protection equipment; protective clothing; air monitoring; and safety procedures for conducting response operations. After completing the course, attendees will be more familiar with general concepts, principles, and procedures for protecting themselves from the harmful effects of hazardous materials, and the acceptable practices for minimizing danger to response personnel.

Segments of this course require the wearing of respiratory equipment which precludes the use of glasses. Portions of this course and course 165.5 are redundant. Persons considering application to both courses should confer with the Registrar.

Continuing Education Units: 2.6

Contact:	Registrar	FTS:	8-684-7537
		DD:	(513) 569-7537

Response Safety Decision-Making (165.8)

4 Days

This course is for persons developing, implementing, or managing safety programs for chemical emergencies or cleanup at abandoned hazardous waste sites. The course complements other EPA basic safety courses and provides participants with more detailed guidance for making effective safety decisions. It is intended as a forum for participants and the staff to exchange information and ideas on response-related safety topics. Workshop topics include safety guidance and regulations on risk assessment, air monitoring, respiratory and protective clothing selection, special problems, and site safety plan development.

After this course, attendees will better understand the responsibilities and liabilities of a response safety officer; be more familiar with the requirements for an overall health and safety program; be more knowledgeable in risk assessment and its impact on safety planning; be better trained in technical areas of response safety; and be better able to develop and implement site-specific safety plans.

Individuals applying for the course are expected to be knowledgeable in basic personnel protection, safety, and response operations. At a minimum applicants must have attended Personnel Protection and Safety (165.2) or Hazardous Materials Incident Response Operations (165.5), similar courses, or demonstrate they are experienced in response safety.

Continuing Education Units: 2.1

Contact: **Registrar** **FTS: 8-684-7537**
DD: (513) 569-7537

Health and Safety in EPA Field Activities Basic Course

3 Days

A course for all EPA field workers and their supervisors, to fullfill EPA order 1440.2, "Health and Safety Requirements for Employees Engaged in Field Activities". The course includes training in recognizing hazards and responding as safely as possible. This workshop emphasises employee rights and responsibilities; selection, use, and care of personal protective equipment and clothing; safe procedures; and preparation for field work.

Contact: **Churmila Zieschang** **FTS: 8-382-3641**
DD: 202-382-3641

PROGRAMMATIC/TECHNICAL-CERCLA

Air Surveillance for Hazardous Materials (165.4)

5 Days

This course instructs participants in the practices and procedures for monitoring and sampling of airborne hazardous materials. It is designed for personnel involved in emergency response to hazardous substances or those who investigate uncontrolled hazardous waste sites.

Topics to be discussed are air surveillance programs; air monitoring techniques and instruments; air sampling techniques and equipment; radiation detection instruments; calibration and quality control; exposure guidelines; health and safety considerations; legal implications; and air dispersion and meteorology. The course will include operating procedures for specific air monitoring instruments and sampling equipment, as well as strategies for surveillance of both abandoned hazardous waste sites and accidental releases of hazardous chemicals.

Continuing Education Units: 2.3

Contact: **Registrar** FTS: 8-684-7537
DD: (513) 569-7537

CERCLA Orientation

4 Days

This introductory course is designed to introduce the new employee to the Superfund Program. The topics covered in the course present an overview of the CERCLA legislation, the National Contingency Plan, program implementation and policy implications, RCRA program interface, community relations, and the removal, remedial, enforcement and support programs.

Instructional methods used in the course include classroom lectures, group discussion, problem solving, case studies and student exercises. Participants will be offered insights into the actual "nuts and bolts" of these programs.

Contact: **Registrar** (800) 451-8161

CERCLIS Enforcement Overview

1/2 Day

This course is designed to provide individuals with a generalized overview of the CERCLIS database and structure with emphasis on the Enforcement program. The course covers database structure, data entry, data retrieval and generation of reports. The course emphasises the Enforcement aspects of CERCLIS by concentrating on select programmatic issues and showing how these issues are reflected in thedata and how the data can provide information to Enforcement program managers and coordinators.

Contact: **Sally Bennett** **FTS: 8-475-6127**
DD: (202) 475-6127

Community Relations in Superfund: Concepts and Skills

2 Days

This course is intended for regional and state program management and technical staff. The course involves skill development in dealing with citizens and local officials, building good media relations, and conflict management. Case studies are used in the course for instruction as well as for discussion purposes.

Contact: **Vanessa Musgrave** **FTS: 8-382-2464**
DD: (202) 382-2464

Construction Management Evaluation

3 Days

This course instructs attendees in the concepts and techniques for construction project evaluation. It is intended to help provide regional and state managers with a perspective on what is needed to evaluate a Superfund construction project.

Course topics include cooperative agreement management, construction management, reporting and documentation.

Upon completion of this course, participants will be able to act more effectively as managers in the Superfund program. They will be more familiar with construction management evaluation and will gain insight into the responsibilities of all parties involved in construction.

Contact: **Tom Whalen** **FTS: 8-382-2457**
DD: (202) 382-2457

Customized CERCLIS Reporting

2 Days

This course is designed to provide individuals who have completed the courses entitled CERCLIS Overview and CERCLIS Enforcement Overview with the functional knowledge necessary to generate customized CERCLIS reports.

Contact:	**Sally Bennett**	**FTS: 8-475-6127** **DD: (202) 475-6127**

Data Quality Objectives

1 Day

This one-day workshop is designed to introduce participants to the Data Quality Objectives concept and process. The course consists of a combination of lectures, group discussions, and exercises. The emphasis is on management issues associated with DQO's rather than on detailed "how-to" technical information.

The course is recommended for managers, program staff, and technical staff who are involved in the design or oversight of environmental data collection activities, as well as for anyone else who wants to become more familiar with the DQO concept. It will be especially valuable for employees whose organizations are about to implement the Data Quality Objectives process.

Contact:	**Shirley Green**	**FTS: 8-382-4431** **DD: (202) 382-4431**

Environmental Risk Assessment (165.6)

4 Days

This basic course provides participants with the fundamentals needed to determine the toxicity of chemicals that have been released into the environment and to assess their risk to public health. Specific concepts will be discussed according to the general risk assessment protocol used by the U.S. EPA. Hazard identification consists of the following topics: fundamentals of toxicology; toxic responses associated with specific organ systems; examples of toxicants by chemical group; and the interpretation of laboratory data and epidemiological studies.

Upon completion of the course, participants will be able to review basic toxicity data, to estimate exposures for various pathways of dispersion, and to adapt these concepts to site-specific risk assessment.

Continuing Education Units: To be determined

Contact:	**Registrar**	**FTS: 8-684-7537**

Geophysics for Hazardous Site Investigations

2 Days

This introductory course is intended for regional and state technical and enforcement staff. The course provides an introduction to geophysical sensing techniques that may be used during investigations at hazardous waste sites. The topics addressed in the course include objectives of subsurface investigations, techniques currently used, advantages and limitations of each technique, the cost of techniques, and how to utilize and interpret data. The course consists of lectures, classroon discussion and case studies.

Contact: Joseph Bahnick FTS: 8-382-4625
DD: (202) 382-4625

Hazard Ranking System

2 Days

This introductory course is geared to regional and state Superfund staff and their contractors. The course introduces the participants to the technical aspects of the Hazard Ranking System and EPA's policy for listing sites on the National Priority List (NPL). Course instruction consists primarily of classroom lecture and discussion. Participants will gain insight into the criteria used for determining the status of a given site as it pertains to clean-up operations.

Contact: Scott Parish FTS: 8-382-5632
DD: (202) 382-5632

Hazardous Materials Cleanup Technologies and their Application at Superfund Sites

2 Days

This introductory course is intended for state and regional CERCLA program management staff. The course offers an in-depth review of the full range of hazardous cleanup technologies applicable to the variety of Superfund sites on the National Priority List. The course consists of lectures, discussions and case studies. Topics presented in the seminar include hazardous materials cleanup technologies and selection methodology for appropriate technologies. For each technology the course examines costs, institutional constraints, and other pros and cons. Changes in the remedial process as a result of SARA are addressed, as well as selection criteria for permanent remedies.

After completing the course, students will have a better understanding of the available hazardous material cleanup technologies and the appropriateness of those technologies to a particular site.

Contact: Registrar: (800) 451-8161

Incident Mitigation and Treatment Methods (165.3)

4 Days

This course instructs attendees in the concepts and techniques for containment, treatment and disposal of hazardous materials associated with accidental releases and uncontrolled waste sites. It emphasizes the practical applications of incident mitigation and treatment technologies. Course topics include first response considerations, hazard evaluation, containment methods, physical, chemical, and biological treatment, disposal options, and safety during response operations.

After completing the course, students will have a better understanding of the fundamentals governing chemical, physical, and biological behavior of material; phenomena that affect treatment processes; practical aspects of containment, on-site treatment, bulking, transport, and disposal; techniques for tracking and recovering contaminants in ground water; and regulatory requirements.

Continuing Education Units: 3.7

Contact: Registrar FTS: 8-684-7537
DD: (513) 569-7537

Introduction to Remedial Design Schedule Management

1 Day

This one day seminar is intended for RPM's, State Project Officers, REM and ARCS contractors, and both the U.S. Army Corps of Engineers and Bureau of Reclamation design managers. During this seminar, a series of generic Remedial Design management schedules will be presented. The presentations will focus on the time-phased schedule logic, typical technologies applicable to the schedules, assumptions used and a description of site specific applications. Also, methods to optimize remedial design management schedules will be discussed.

Course instruction consists of lectures, discussions, slides and handouts. Attendees will be provided with a bound document containing copies of the presentation slides, the standard remedial design tasks, the remedy specific generic remedial design schedules and appropriate background data and references.

Upon completion of the seminar, attendees will be able to develop design management schedules that will result in a successful project. That is, the design will be consistent with the ROD and completed on time, as well as within budget.

Contact: Tom Whalen FTS: 8-382-2457
DD: (202) 382-2457

Management of Construction in the Superfund Program

3 Days

This course provides an introduction to the management of construction in the Superfund program. It is intended to help provide regional and state managers with a perspective on what is needed to plan, schedule and control a Superfund construction project. The course addresses the management issues to be considered in the construction activity, and provides a foundation from which attendees will grow in their technical and administrative competence.

Course topics include successful management practices, the bidding process, procurement practices, project design, management of change orders and claims, and construction inspections. Training is provided by means of classroon lecture, case studies and group discussion.

Upon completion of this course, participants will be able to more effectively act as managers in the Superfund program. Participants will be more familiar with construction management and will have a clearer understanding of authorities and responsibilities of all parties involved in construction.

Contact: Jim Felix DD: (303) 236-8330

OSC/RPM Basic Skills Training

4 1/2 Days

This introductory course is designed to introduce new employees hired as OSCs or RPMs to the roles and responsibilities of their job, and is designed to provide interaction among employees from various regions. Topics covered in the course present an overview of the tasks new OSCs and RPMs perform, including notification, evaluation and planning, and removal operations for OSCs; and site plan development, RI/FS, RODS, RD/RAs for RPMs. The course consists of classroom lectures, group discussion, case studies and student exercises.

Contact: Registrar: (800) 451-8161

Preliminary Assessment/Site Investigations (PA/SI)

3 Days

This course is intended for State and contractor personnel who are conducting preliminary assessments and on-site investigations of hazardous waste sites for the purpose of generating a hazard ranking system score. The course provides a brief overview of the Superfund program and discusses the sequences of tasks for a site inspection. It also addresses safety and sampling considerations and presents a detailed overview of the Hazard Ranking System. The course concludes with an exercise which requires attendees to prepare a sampling plan for a sample case site.

Upon completion of the course, attendees will have a better understanding of the process involved in conducting a site investigation, the strategy for developing a sampling plan for a preliminary assessment and a site inspection, and the content of the final site inspection reports.

Contact: Lucy Sibold FTS: 8-382-2454
DD: (202) 382-2454

PRP Search Workshop

2 Days

This course is designed for EPA, State agency enforcement and waste personnel, DOJ, and contractors involved in the PRP search process. It provides participants with the tools necessary to ensure that a thorough PRP has been conducted to identify all parties with potential liability for hazardous waste at a site.

Contact: Steve Suprun FTS: 8-475-8254
DD: (202) 475-8254

Remedial Investigation/Feasibility Study (RI/FS) Workshop

3 Days

This course is designed to inform regional and state remedial staff on RI/FS policies and procedures, particularly as they have been modified to reflect the Superfund Amendments and Reauthorization Act (SARA) and program efforts to streamline the process. Topics to be covered include: planning, managing and scoping projects, risk assessment, development/screening/evaluation of alternatives, preparing a proposed plan and site specific strategies.

Contact: Steve Golien FTS: 8-475-6703
DD: (202) 475-6703

Sampling for Hazardous Materials (165.9)

3 Days

This course provides personnel with no or minimal sampling experience, practical information for effectively sampling hazardous materials. The course focuses on the types of equipment suitable for hazardous materials sampling and procedures for safely collecting samples. Topics to be discussed include: sampling plan development; the statistical basis for sampling; equipment and procedures for sampling containerized materials, surface water/lagoons, sediments/sludges, soils and ground water; compatibility testing; sample shipment; safety in sample collection; and quality control/quality assurance considerations. Instructional methods used are lectures, group discussions, demonstrations, and field exercises with an emphasis on hands-on use of multi-media sampling equipment.

After completing the course, attendees should be more knowledgeable about the design of sampling programs, the equipment and procedures for sample collection, sampling safety, the regulations on transporting samples, and the use of statistics in sampling.

Continuing Education Units: 2.0

Contact: **Registrar** FTS: 8-684-7537
DD: (513) 569-7537

Skills Development in Negotiation of CERCLA/RCRA Disputes

3 Days

This course is intended for Headquarters, Regional and State technical enforcement staff and attorneys with responsibility for negotiation of RCRA or CERCLA hazardous waste site cleanups. The course includes lectures on the basic skills of negotiations, how to deal with tricks and tactics, negotiating for the government, and on the types of alternate dispute resolution techniques (mediation, arbitration, special masters). The course also includes four simulations in which the attendees role play simulated negotiations.

Upon completion of the course, participants will have improved their negotiating skills and be more knowledgeable about negotiation issues concerning CERCLA and RCRA disputes.

Contact: **Deborah Thomas** FTS: 8-475-7028
DD: (202) 475-7028

Superfund Enforcement Case Settlement Analysis System

1 Day

This seminar for EPA enforcement staff provides a briefing and hands-on demonstration of the computer assisted Superfund Settlement Analysis System. No prior experience with computers is necessary. The seminar will use an actual case to demonstrate the data gathering steps needed to feed the computer model, and will simulate several different outcomes of settlement offers (cash contributions). The model has recently been revised in a user-friendly format. Those staff with some experience in the Superfund Settlement Analysis System are invited to bring with them to the seminar sample cases for demonstration purposes.

Participants in the seminar will be able to use the decision analysis technique and will be able to operate the model for analysis of settlement offers. The course is available by request.

Contact:	Brad Wright	FTS: 8-382-4837
		DD: (202) 382-4837

PROGRAMMATIC/TECHNICAL- RCRA

Citizen Participation by Objectives

2 1/2 Days

In this companion workshop to Systematic Development of Informed Consent (SDIC), participants further explore the principles of community involvement described in the preceeding SDIC training. Techniques and strategies are explored concerning effective interaction with the media, special interest groups and the public at large. The workshop is limited to a small number of participants, allowing ample time to explore in some detail, the principles related in the preceeding SDIC training.

Contact:	Kate Connors	FTS	8- 475-6647
		DD:	(202) 475-6647

Incinerator Permitting

2 Days

This two day course trains new permit writers in the basics of incineration technology and permitting. It covers basic combustion concepts, incineration design, incinerator regulations, exemptions, monitoring, trial burn planning and observation, and establishing permit conditions.

Contact:	Sonia Stelmack	FTS:	8-382-4500
		DD:	(202) 382-4500

Laboratory Compliance with RCRA (Video)

22 Minutes

The target audience for this video is lab personnel including bench chemists, lab technicians, and other lab personnel whose primary activities and responsibilities require them to perform analysis or conduct research. These personnel are not always trained on federal requirements regarding proper management of the wastes created in the laboratory. The video describes how the Federal hazardous waste rules apply to lab staff and conveys the importance of working with the waste control officer who is responsible for managing the actual recycling, transportation, treatment, storage and/or disposal.

Contact:	Rolf Hill	FTS:	8-475-7037
		DD:	(202) 475-7037

OWPE Corrective Action Order Workshop

3 Days

This workshop is intended for regional personnel involved with corrective action. The objectives of the workshop are to summarize and reinforce the approach to corrective action presented in OSWER guidance, improve the job skills of regional personnel, discuss regional issues related to the use of Section 3008(h) authority at specific facilities, and assure consistent regional implementation of the Section 3008(h) procedures, model order and Corrrective Action Plan.

Course instruction is accomplished through lecture, discussion and course studies. The workshop includes a description of the corrective action process, a review of the scope and applicability of corrective action authorities, a discussion of the development of Section 3008(h) corrective action orders, the use of the Corrective Action Plan and other OSWER guidance to develop the Scope of Work, and oversight during the corrective action process.

Contact: **Steve Hooper** **FTS: 8-475-9870**
DD: (202) 475-9870

Public Involvement Training

2 Days

This course outlines a procedure to involve the local community in decision-making efforts concerning a hazardous waste management facility's permitting system. The course identifies a number of activities that should be conducted during the permitting process, including preparing for and conducting a public meeting and communicating with the media. The course's major emphasis is planning and organizing public involvement efforts. Suggested techniques for issuing public notices, holding meetings, and responding to comments also are discussed. The course includes a training manual accompanied by hand-outs, color videotapes, and role-play activities.

Contact: **Frank McAllister** **FTS: 8-382-2223**
DD: (202) 382-2223

RCRA Facilities Investigation/(RFI) Guidance Training

4 Days

The RCRA Facilities Investigations Course will cover all major subject areas pertaining to RCRA facilities. Topics covered will include a review of the corrective actions process, sampling and analysis, workplan development and implementation, as well as planning and management. Other lectures, supplemented by workshops, will include such topics as site characterization, surface water, groundwater, air, soil and subsurface gas.

Contact:	Art Day	FTS:	8-382-4658
		DD:	(202) 382-4658

RCRA Facility Assessment

2 1/2 Days

This course outlines strategies for identifying and cleaning up hazardous waste or hazardous constituents that threaten human health or the environment. Emphasis is placed on providing information on sampling - particularly with regard to the analysis, interpretation, and recommendations on substances collected. Physical safety aids also are discussed. Instructional activities include lecture and case study analysis.

Contact:	David Fagen	FTS:	8-382-4497
		DD:	(202) 382-4497

Construction of RCRA Ground-Water Monitoring Wells (Video)

12 Minutes

Interested audience includes RCRA enforcement personnel and permit writers in the States and Regions involved with ground-water monitoring activities. The video tape reviews the installation of a CRA monitoring well as per the EPA guidance, "RCRA Ground-water Monitoring Technical Enforcement Guidance Document". The tape also includes information about purging and sampling equipment. Each EPA Region has a copy of the tape as does EPA Headquarters in Washington D.C.

Contact	Peter Siebach	FTS:	8-475-9849
		DD:	(202)475-9849

RCRA Ground-Water Monitoring: Use of the TEGD and COG

3 1/2 Days

This intermediate level course is intended for regional, state and local RCRA employees involved in program management and inspections; or technical, Enforcement or Permits staff members. The course emphasizes the use of sections of the Technical Enforcement Guidance Document (TEGD) and the Compliance Order Guidance (COG).

The goals of the course include: providing technical guidance to the regions and states in the evaluation of RCRA ground-water monitoring systems; providing a regulatory and policy basis for technical approaches to RCRA ground-water monitoring programs and strategies for obtaining technical objectives; and promoting an integrated approach to regulating RCRA ground-water monitoring facilities among enforcement, permits, field inspectors, and attorneys. The course instructional methods consist of classroom lectures and discussion, simulations, video presentations and case studies.

Contact: Ned Pryor FTS: 8-475-9868
DD: (202) 475-9868

RCRA Inspector Training

3 1/2 Days

This three and one-half day course is for regional and State RCRA Inspection Personnel. The course will impart current information on regulations, new inspection guidance documents, and field techniques to improve the inspectors ability to detect and document violations.

Contact: Peter Siebach FTS: 8-475-9849
DD: (202) 475-9849

RCRA Orientation Training for Permitting/Enforcement Personnel

2 Days

This training course is intended for RCRA permitting and enforcement staff and support personnel. The course is designed to present and explain frequently encountered problems and to introduce available RCRA resources and reference materials. The course is aimed toward improving the communication and coordination between the permitting and enforcement activities under RCRA.

Course instruction consists of lectures, discussions, and demonstrations. Course topics concerning enforcement and permitting include: General Facility Standards; Containers; Tanks; RD&D; Land Disposal; Ground-Water; and Incineration. The other session includes topics on Regulatory Compliance for TSD Facilities; Regulatory Compliance for Generators and Transporters; Outcome of Inspections/Reviews and a Problem Session. The Joint Permitting/Enforcement sessions include: Corrective Action; RCRA/CERCLA Overlap; Federal Facilities; Permitting/Enforcement Interface and Facility Management planning.

Course attendees are expected to have a basic level of competence in their job responsibilites and an understanding of the RCRA program. Such knowledge and experience generally requires approximately 4-12 months of job-related experience and at least prior review of the RCRA orientation manual.

Contact: Thea McManus FTS: 8-475-8818
DD: (202) 475-8818

State Authorization Workshop II

3 Days

The course is designed for regional personnel who are responsible for developing State hazardous waste programs. The objectives are to provide guidance on assembling program revision applications; assist in establishing dialogues for issue resolution between EPA (HQ and Regions) and states. It will also cover parts of the application (program description, Attorney General statements, etc.) and guidance/interpretation of recent EPA guidance policy.

Contact: Judi Kane FTS: 8-382-2222
DD: (202) 382-2222

Systematic Development of Informed Consent

3 1/2 Days

This training course is geared toward RCRA program managers and state and regulated industry representatives. The course concerns public sector problem solving and community involvement. Lecture and discussion are the primary means of course instruction. This course is a general course on "how to" get things done whether it is with interagency staff, interest groups or local citizens.

Contact:	**Kate Connors**	**FTS: 8-475-6647** **DD: (202) 475-6647**

PROGRAMMATIC/TECHNICAL-Ground Water

ADA Basic Ground Water Course

3 Days

This introductory course is intended for all EPA and state employees who require a better understanding of ground-water issues. The course offers a general overview of basic hydrogeology and ground-water movement, contaminant transport, ground-water investigations, aquifier restorations and ground- water modeling. The course consists of lectures, demonstrations and classroom discussions. Upon completion of the course, students will have a better understanding of basic hydrogeology and ground-water movement, and related subjects.

Contact: Jerry Thornhill FTS: 8-743-2310
DD: (405) 332-8800

Introduction to Ground-Water Investigations (165.7)

3 Days

This introductory course is intended for personnel with little prior training in the subject of ground water. The course focuses on ground-water investigations, monitoring well placement, well construction and the collection of samples. Topics to be discussed include ground-water hydrology, ground-water pollution, monitoring well placement, well construction, sampling, legal considerations, and quality control/quality assurance.

After completing the course, attendees should be more knowledgeable about the basic characteristics of ground-water flow; chemical, physical and biological factors affecting ground-water contamination; design of ground-water monitoring networks; monitoring well construction; ground water sampling; and ground-water restoration.

Continuing Education Units: To be determined

Contact: Registrar FTS: 8-684-7537
DD: (513) 569-7537

Computer Modeling

3 Days

Topics include the models available, components and applications (model name, access, purpose, operating principles, quality control, input required and output generated). This is a hands-on lab taught by technical experts. Requires basic knowledge of modeling concepts and computer literacy.

Contact: Camille Lee FTS: 8-382-4506
DD: (202) 382-4506

PROGRAMMATIC/TECHNICAL-Emergency Preparedeness

Hazardous Materials Contingency Planning

4 1/2 Days

This course is jointly sponsored by EPA and FEMA and is intended for regional, state and local employees requiring a basic understanding of contingency planning and related issues. The course includes actual examples of emergency situtations and addresses legal, technical and financial aspects of contingency planning.

The training encompasses such topics as pertinent statutes; local, state and Federal responsibilites; contracts and cooperative agreements; development of a response plan; types and storage of hazardous materials; preventive measures; disclosure of facilites; and local, state, and Federal ordinances. Instructional methods used in the course include lectures, demonstrations and classroom discussion.

Contact:	Janice Quinn	FTS: 8-382-4667 DD: (202) 382-4667

Hazardous Materials Response for First Responders (165.15)

5 Days

This course is intended for members of hazardous material response teams, teams that are being formed, or for others who may be called upon to respond to a chemical release. Emphasis is on the hands-on-use of equipment and exercises for practically applying lecture information. Topics to be discussed include: chemical and physical properties of hazardous materials; toxicology, recognition and identification of hazardous materials; personnel protective equipment; direct-reading instruments; standard operating procedures; response organization; and sources of information.

Persons who have previously attended the course Hazardous Materials Incident Response Operations (165.5) or Personnel Protection and Safety (165.2) should not apply for this course.

Continuing Education Units: To be determined

Contact:	Registrar	FTS: 8-684-7537 DD: (513) 569-7537

Title III Information Management Workshops

2 Days

Five workshops will be presented in the summer of 1988 and are intended for SERC, LEPC, and First Responder representatives. Attendance is by invitation issued through the EPA Regional Offices. The purpose of the workshops is to: clarify understanding of Title III regulations and its state and local requirements; identify Federal information resources pertinent to Title III that are available to SERC's and LEPC's; and to provide a forum for discussion among local and state organizations in order to improve their ability to respond fully to Title III requirements. Presentations will address these issues, as well as provide information on available tools to help manage and use information (both automated and non-automated), disseminate information to the public and communicate risk. The workshops will include presentations by both Federal and state representatives.

Contact: **Tony Jover** **FTS: 8-382-2387**
DD: (202) 382-2387

TECHNOLOGY TRANSFER

Air Toxics Workshops

A series of workshops for agency and industry personnel will present the state of the art of knowledge and expertise in this area. The workshop will serve to accelerate communications among those working in the hazardous and air toxics field.

Contact:	N. Kulujian	FTS: 8-684-7349 DD: (513) 569-7349

Alternative Treatment Technologies for Superfund Waste Sites

2 Days

This two-day workshop provides attendees a wide array of treatment alternatives with associated costs and limitations. This new series of seminars will present proven treatment technologies and provide technical and management guidance on their selection and application. The seminars will include 5 sessions of 2 1/2 to 3 1/2 hours devoted to a specific topic. Speakers will be selected from a pool of experts in the technologies for managing hazardous wastes.

Contact:	Fran Kremer	FTS: 8-684-7346 DD: (513) 569-7346

Assessment and Management of Drinking Water Contamination

These regional workshops are aimed at improving the ability of decision makers to respond effectively to incidents of drinking water contamination. These workshops present information on the health effects, toxicology, analytical methods and treatment technologies available for four major classes of contaminants: organics, inorganics, solvents and pesticides. An opportunity is provided for participants to take part in case studies designed to demonstrate the risk assessment and risk management methods necessary to resolve a drinking water contamination incident.

Contact:	O. Macomber	FTS: 8-684-7347 DD: (513) 569-7347

Compliance Strategy for Underground Storage Tanks

A seminar series will be developed for the regulators (Federal and state agency personnel) and the regulated community (underground tank owners and operators) presenting leak detection and prevention methods, and techniques for corrective actions.

Contact: N. Kulujian FTS: 8-684-7349
DD: (513) 569-7349

Corrective Action: Technologies and Alternatives

The technology transfer seminars will be conducted, addressing PA/SI and alternative corrective actions. The seminars will be built around the Risk Assessment/Risk Management strategies for implementing corrective action. The basic investigative procedures would constitute the risk assessment part of the seminars, and the review and application of control technologies would be presented in the context of risk management. Projects in which technologies have been successfully used will be reviewed.

Contact: Doug Williams FTS: 8-684-7361
DD: (513) 569-7361

Hazardous Waste Minimization Methods and Procedrues

A series of seminars will be presented on waste minimization and procedures for key industrial sectors (industrial and hazardous material managers, government inspectors and permit writers, consulting engineers and SQGs). The focus of these seminars will deal with specific unit process operations common to the industry category and will deal with air, water, and solid waste generation.

Contact: N. Kulujian FTS: 8-684-7349
DD: (513) 569-7349

Hazardous Waste Landfill Design

2 Days

The emphasis of this course will be to establish a rational design sequence for landfill cells and then develop the specifics of each major component. The course will center around preparation of sample calculations for an example landfill. Complete design calculations will be developed for this example,and sample field testing data presented to aid in explaining construction quality assurance procedures. With this knowledge,EPA Regional and State permit writers and reviewers should have a better background for what is required in landfill design and construction.

Contact: O. Macomber FTS: 8-684-7347
DD: (513) 569-7347

Land Disposal Restriction Program Implementation

This workshop will provide technical guidance and training to EPA regions, state governments and the regulated community in performing technical evaluations and permitting requirements for the land disposal restrictions program.

Contact: O. Macomber FTS: 8-684-7347
DD: (513) 569-7347

RCRA/CERCLA Treatment Alternatives to Hazardous Waste Landfills

2 Days

This two-day seminar is targeted to 300-400 Federal/State officials, industrialists, consultants and facility owners and operators. Case studies will be the framework for the presentations. All details will be presented in the context of their relative importance to the success of the given case. Costs, waste quantity/quality data, results of technology implementation, applicable permit conditions, site cleanup limits and goals, and the relationship of the technology to regulations will be discussed. Five major sessions of 2 1/2 to 3 1/2 hours will be held. Each session will be developed to a specific theme:

- ❐ Alternative/Innovative Approaches to Waste Minimization and Recycling
- ❐ Remedial and Corrective Actions
- ❐ Alternative Technologies to Incineration and Thermal Destruction
- ❐ Technologies for Detoxification and Destruction
- ❐ Developing Technologies for Safe Ultimate Disposal

Because the seminars will be built around case histories, engineers and scientists who have direct experience with the implementation of alternative techniques and approaches will be speakers.

Contact: Clarence Clemmons FTS: 8-684-7358
DD: (513) 569-7358

Solvent Waste Reduction Alternatives

A series of technology transfer seminars will determine whether information will be presented on a technology or industry approach. Surveys indicate that the chemical and allied products industry (SIC 28) accounts for over half the nations total hazardous waste volume. CERI will coordinate the effort with HWERL and OSWER personnel in addition to states having recycling exemptions, financial incentives, and information programs. Four to eight seminars will be presented in EPA Regions.

A seminar publication will cover solvent-using industries and present alternatives to land disposal. The major topics will include: source reduction, focusing on in-plant changes that can either reduce or eliminate solvent waste generation; recycling of a wastestream substance or reclamation of waste material; and treatment technologies such as incineration and chemical fixation/oxidation alternatives.

Contact: N. Kulujian FTS: 8-684-7349
DD: (513) 569-7349

Transport and Transformation of Subsurface Pollutants

A series of ten Technology Transfer Seminars will provide current knowledge of transport theories and mechansims. The use and limitations of predictive tools to improve the utility of models in ground-water management will also be covered.

Contact: Carol Grove FTS: 8-684-7362
DD: (513) 569-7362

QUALITY ASSURANCE

Data Quality Objectives

1 Day

This workshop is designed to introduce participants to the Data Quality Objectives (DQO) concept and process. The course consists of a combination of lectures, group discussions and exercises. The emphasis is on management issues associated with DQO's rather than on detailed "how-to" technical information.

Contact: Shirley Green FTS: 8-382-4431

Orientation to Quality Assurance Management

1 Day

This workshop serves as an orientation to the basic management issues associated with EPA's quality assurance program for environmental data collection. Using discussions, group exercises and lecture presentations, it will provide participants with a systematic non-technical introduction to the primary elements and concepts of quality assurance.

Contact: Shirley Green FTS: 8-382-4431
DD: (202) 382-4431

Control Measures for CO, O_3 and NO_x

3 Days

This introductory workshop presents a view of the major control measures used to attain and maintain the National Ambient Air Quality Standards for carbon monoxide, ozone and nitrogen oxides. The lessons include information about the sources and effects of these pollutants, the control activities used to reduce concentrations in the atmosphere, measurement techniques, regulatory activities, enforcement techniques and other related topics.

Contact: Shirley Green FTS 8-382-4431
DD. (202) 382-4431

RISK ASSESSMENT

Human Exposure Seminars

1 Day

This seminar series presents the fundamental concepts of the total human exposure approach, the existing exposure data bases and the use of these data basis in making risk estimates. The seminars consist of structured lectures by many experts in the field from both within and outside EPA.

Contact: **Shirley Green** FTS: 8-382-4431
DD: (202) 382-4431

Superfund Public Health Evaluation

2 Days

This beginning level course is intended for federal and state employees responsible for reviewing, supervising or facilitating the work of consultants or technical experts in performing risk assessments. The course consists of lectures, discussions, and practical exercises in risk assessment. Topics include an overview of chemical risk assessment; hazard identification and dose-response assessment; exposure assessment and risk characterization; and risk communication. Day two provides an overview of the Superfund Public Health Evaluation Process, including an intensive case study exercise.

After completing the course, students will have a better understanding of toxicology for use in recommending or reinforcing site safety procedures, supervising or reviewing site activities, and presenting site-related toxicological data to the public, as well as direct experience in utilizing the Superfund Public Health Evaluation Process.

Contact: **Ginger Wandless** FTS: 8-475-9492
DD: (202) 475-9492

Note: This training will be unavailable in FY '88 as the guidance is currently under revision

Workshop on Risk and Decision-Making

2 Days

This course is intended for Headquarters and Regional employees. The course emphasizes the use of case studies in evaluating risk assessment, risk management and risk communication. Course instruction occurs in small groups, which are each headed by a group facilitator. Upon completion of the course, participants will have a better understanding of decision-making relative to risk assessment, risk management and risk communication.

Contact:	Shirley Green	FTS:	8-382-2594
		DD:	(202) 382-2594

APPENDIX

REGISTRATION FORMS

REGISTRATION FORM

Course ____________________ Date ____________________

Location ____________________

Name: ____________________

Organization ____________________

Address ____________________

City ____________________ State __________ Zip __________

Instructions: The following information is requested to enable the course instructors to become more familiar with the attendees and thereby target their presentations more directly to your needs. Responses to all questions are optional and confidential, and will be used only for this purpose.

1. My job position is: ____________________

2. My job responsibilities include: ____________________

3. My job is primarily:

   ☐ Management ☐ Technical ☐ Enforcement

4. How long have you been in your current job position?

   ☐ Less than one year ☐ One to five years ☐ Six to ten years
   ☐ Eleven to fifteen years ☐ Over fifteen years

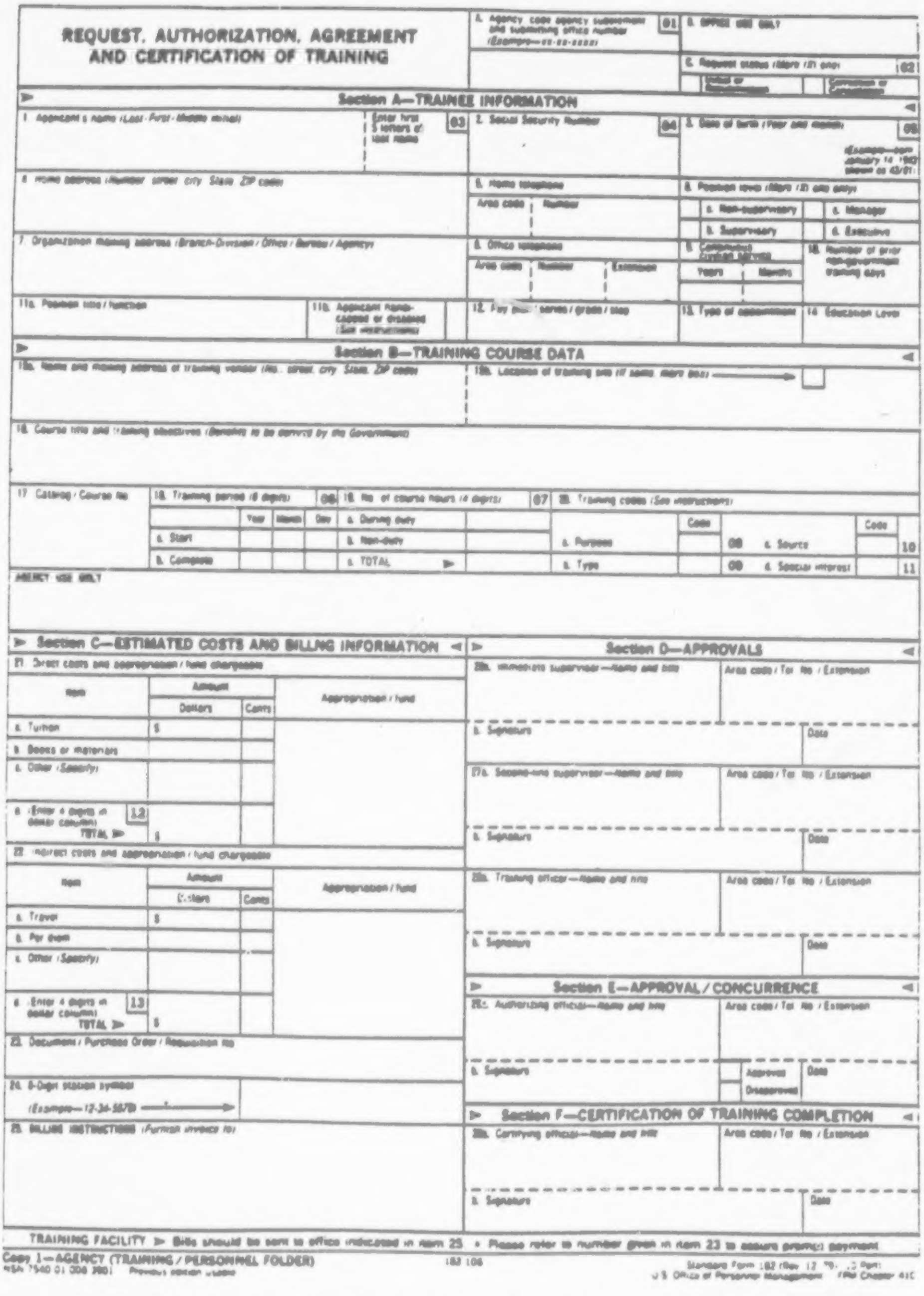
5. Formal educational background:

   ☐ Less than 12 years ☐ High school diploma ☐ Some college
   ☐ Bachelor's degree ☐ Master's degree or some graduate work
   ☐ Doctoral degree

6. Major subject area(s) ____________________

7. Have you attended other hazardous materials training in the subject area of this course offered by your state, professional association, or other organization? If yes, please provide course titles and sponsors.

   Course Title: ____________________ Sponsor: ____________________



REQUEST, AUTHORIZATION, AGREEMENT AND CERTIFICATION OF TRAINING

A. Agency code, agency subelement and submitting office number 01

B. OFFICE USE ONLY

C. Request status (Mark (X) one) 02

☐ Initial or Resubmission ☐ Correction or Cancellation

Section A—TRAINEE INFORMATION

1. Applicant's name (Last-First-Middle initial) | Enter first 5 letters of last name 03

2. Social Security Number 04

3. Date of birth (Year and month) 05

4. Home address (Number, street, city, State, ZIP code)

5. Home telephone: Area code | Number

8. Position level (Mark (X) one only): ☐ a. Non-supervisory ☐ b. Supervisory ☐ c. Manager ☐ d. Executive

7. Organization mailing address (Branch-Division/Office/Bureau/Agency)

6. Office telephone: Area code | Number | Extension

9. Continuous Civilian Service: Years | Months

10. Number of prior non-government training days

11a. Position title/function

11b. Applicant handicapped or disabled (See instructions)

12. Pay plan/series/grade/step

13. Type of appointment

14. Education Level

Section B—TRAINING COURSE DATA

15a. Name and mailing address of training vendor (No., street, city, State, ZIP code)

15b. Location of training site (If same, mark box) ⟶ ☐

16. Course title and training objectives (Benefits to be derived by the Government)

17. Catalog/Course No.

18. Training period (6 digits) 06

	Year	Month	Day
a. Start			
b. Complete			

19. No. of course hours (4 digits) 07

a. During duty	
b. Non-duty	
c. TOTAL ▶	

20. Training codes (See instructions)

	Code			Code	
a. Purpose		08	c. Source		10
b. Type		09	d. Special interest		11

AGENCY USE ONLY

Section C—ESTIMATED COSTS AND BILLING INFORMATION

21. Direct costs and appropriation/fund chargeable

Item	Amount		Appropriation/fund
	Dollars	Cents	
a. Tuition	$		
b. Books or materials			
c. Other (Specify)			
d. (Enter 4 digits in dollar column) 12 TOTAL ▶	$		

22. Indirect costs and appropriation/fund chargeable

Item	Amount		Appropriation/fund
	Dollars	Cents	
a. Travel	$		
b. Per diem			
c. Other (Specify)			
d. (Enter 4 digits in dollar column) 13 TOTAL ▶	$		

23. Document/Purchase Order/Requisition No.

24. 8-Digit station symbol (Example—12-34-5678) ⟶

25. BILLING INSTRUCTIONS (Furnish invoice to)

Section D—APPROVALS

26a. Immediate supervisor—Name and title | Area code/Tel. No./Extension

b. Signature | Date

27a. Second-line supervisor—Name and title | Area code/Tel. No./Extension

b. Signature | Date

28a. Training officer—Name and title | Area code/Tel. No./Extension

b. Signature | Date

Section E—APPROVAL/CONCURRENCE

29a. Authorizing official—Name and title | Area code/Tel. No./Extension

b. Signature | ☐ Approved ☐ Disapproved | Date

Section F—CERTIFICATION OF TRAINING COMPLETION

30a. Certifying official—Name and title | Area code/Tel. No./Extension

b. Signature | Date

TRAINING FACILITY ▶ Bills should be sent to office indicated in item 25 • Please refer to number given in item 23 to assure prompt payment

Copy 1—AGENCY (TRAINING/PERSONNEL FOLDER)

NSN 7540-01-006-3801 Previous edition usable

182-106

Standard Form 182 (Rev. 12-79)

U.S. Office of Personnel Management FPM Chapter 410

NOTE: This is a copy of a multi-set form and photocopying may not be adequate.

QUESTIONS FOR EPA

Question 14: Does EPA have in place a system by which it can measure the performance of the Superfund program? Please describe the Superfund Comprehensive Accomplishments Plan (SCAP), the Agency Strategic Planning and Management System (SPMS) and how they coordinate with each other. Are there any other such systems?

Answer: OSWER's Superfund Comprehensive Accomplishments Plan (SCAP) and the agency-wide Strategic Planning and Management System (SPMS) are two key elements in the Agency's ongoing efforts to track and evaluate Superfund program performance. The office-wide SCAP contains annual plans for numerous program outputs and is used both as a yardstick for evaluating actual program performance and as a budget and resource allocation tool. SPMS, the Administrator's agency-wide performance tracking system, is comprised of those SCAP measures which have been deemed to be of particular significance. HQ/Regional negotiations result in annual Regional output commitments for all SCAP and SPMS measures. Performance against these commitments is reported quarterly via the program's official database. The Agency's evaluation efforts are supplemented by other analytic tools including regular on-site reviews by headquarters management to discuss Regional performance and "focus studies" used to illuminate issues impacting the achievement of Regional commitments.

Question 15: The National Contingency Plan (NCP) and Hazard Ranking System (HRS) are keys to Superfund Program implementation. What are the issues delaying the revisions of both?

The revisions to the NCP have been extensive because of the changes brought about by SARA. The complex, sometimes problematic, language of the amendments has raised numerous issues that have needed analysis and thorough discussion within the Agency in order to reach resolution. Among these issues are the following:

1) Selection of remedy - how to implement the law's mandate to utilize permanent solutions and alternative treatment technologies to the maximum extent practicable; how to balance this mandate with other necessary factors, some of which may compete with it (such as cost-effectiveness); how to achieve quick, efficient actions while still addressing the statutory requirements?

2) Compliance with applicable or relevant and appropriate requirements (ARARs) - what criteria to use to determine whether a requirement is an ARAR; what remedial situations trigger applicability of RCRA or make RCRA requirements relevant and appropriate; under what circumstances MCLs or MCLGs are relevant and appropriate; how to define "promulgated" for the purpose of determining State ARARs?

3) State involvement - how to develop regulations providing for substantial and meaningful involvement by States; how to create a working partnership between EPA and States in nearly every phase of response; whether to defer listing a site on the National Priorities List if there is an adequate State authority to address the site?

4) Administrative record/public comment - for remedial actions, when the record opens and closes, when it may be re-opened, what material goes into the record, when public comment is necessary after the ROD; for removal actions, whether to require public comment on the record for emergency or time-critical actions?

5) Community relations - whether to incorporate additional requirements above those in the statute, such as interviews with appropriate persons near a site?

[HSED to add answer on HRS]

Question: 15. The National Contingency Plan (NCP) and Hazard Ranking System (HRS) are key to Superfund Program implementation. What are the issues delaying the revisions of both?

Answer: In responding to SARA and the intent of Congress, EPA carefully studied the options for revising the HRS to ensure that it more accurately assessess the relative degree of risk, to the maximum extent feasible. Consequently, to evaluate the broadest range of options, EPA formed the HRS Revisions Work Group and for over a year representatives from State environmental agencies, EPA Regions, and EPA Headquarters offices worked on the complicated issues involved in revising the HRS. In addition, the Agency considered information received in response to the ANPRM and a public meeting in developing the proposed revisions to the HRS. EPA also received scientific review of selected technical issues from the Science Advisory Board to ensure technical excellence in the revised HRS.

The SARA mandate for revising the HRS to be more accurate and include a number of new factors (human food chain, potential air release etc.) has required EPA to focus on resolving a number of technical and policy issues. For example, the Agency has attempted to assign the appropriate scoring weights between public health versus environmental impacts. Although not part of the model, the Agency has been considering various methods to establish a cutoff score under the revised HRS. These issues and others are extremely important to the revisions effort and have required careful evaluation. EPA has submitted the proposed HRS preamble and rule to OMB for review and expects to obtain clearance shortly.

Question 16: Are all NPL deletions considered to be permanent solutions?

Answer: Deletion from the NPL signifies that "no further response is appropriate" because one or more of the following criteria have been met:

(1) EPA, in consultation with the State, has determined that responsible or other parties have implemented all appropriate response actions required;

(2) All appropriate Fund-financed response under CERCLA has been implemented, and EPA, in consultation with the State, has determined that no further response by responsible parties is appropriate; or,

(3) Based on a remedial investigatyion, EPA, in consultation with the State, has determined that the release poses no significant threat to human health or the environment and remedial measures are not appropriate.

It should be noted that deletion does not preclude subsequent Fund-financed or PRP response should the need arise. The National Contingency Plan expressly provides that action may be taken at deleted sites without returning the sites to the NPL where conditions warrant such action (40 CFR 300.66(c)(8).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 16 1988

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Honorable James L. Oberstar
Chairman, Subcommittee on Investigations
and Oversight
Committee on Investigations and Oversight
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

During the Subcommittee's April 20, 1988 Hearing on the Environmental Protection Agency's implementation of the Superfund program, a preliminary review was given by the Office of Technology Assessment (OTA) of several recent Superfund Records of Decision (RODs).

In my response to the OTA's discussion of RODs, I indicated that I believed the OTA focus was often too narrow. That is, we believe that Superfund selections of remedy require considerable more thought and analysis than simply OTA's focus on "permanence" and "treatment". While these two concepts are very important, as noted in the Superfund Amendments and Reauthorization Act (SARA); there are many other factors which SARA calls for. As I indicated, we have reduced the SARA requirements as well as our own experience to the following nine selection criteria:

- Compliance with applicable or relevant and appropriate requirements
- Reduction of toxicity, mobility, or volume
- Short-term effectiveness
- Long-term effectiveness and permanence
- Implementability
- Cost
- Community acceptance
- State acceptance
- Overall protection of human health and environment

In order to more fully respond to the OTA comments, I have also included brief summaries of our thought processes in selecting remedies for a number of sites noted by OTA. These are attached.

I hope the enclosed materials provide you with a more complete understanding of the many factors involved in the remedy selection process. EPA will continue to pursue remedies that best meet all the SARA statutory requirements.

Lee Thomas and I thought the April 20 hearing was very useful and commend you for conducting these investigations. We will look forward to working closely with OTA on their continuing analysis. Thanks very much for your interest in the Superfund program.

Sincerely,

Win Porter

J. Winston Porter
Assistant Administrator

cc: Honorable William F. Clinger, Jr.

LEE'S LANE, KENTUCKY

The Lee's Lane Landfill site is located adjacent to the Ohio River in Jefferson County, Kentucky. The landfilling operations were reported to have begun in the late 1940s and received domestic, commercial, solid municipal, and industrial waste prior to its closure in April 1975. In March 1975, homeowners in an adjacent community reported flash fires around their water heaters. A subsequent investigation detected explosive levels of methane gas and seven families were evacuated and ultimately purchased by the county. Surface water, soil, and ground water were contaminated with benzene, heavy metals including lead, arsenic and chromium, as well as inorganics.

The selected remedy outlined in the Record of Decision (ROD) signed by EPA on September 25, 1986, includes: a properly operating gas collection system; consideration of a possible future alternate water supply; cleanup of surface waste area which involve off-site disposal of exposed drums, capping of "hot spot" soils and an area containing exposed trash; bank protection controls which include the installation of riprap to minimize erosion potential and failure of the Ohio River embankment; establishment of an alternate concentration limit (ACL) for the ground water at the site; institutional controls; and ground water, gas, and air monitoring. The estimated cost for the remedy is $2-3 Million (M) with annual O&M costs of $127,000. The state of Kentucky was consulted and has agreed with the remedy selected by EPA. The remedy has been completed and is currently being recommended for deletion from the National Priorities List (NPL).

The selected remedy was found to offer the best protection of the environment as well cost efficient. The other alternatives considered in the Remedial Investigation/Feasibility Study (RI/FS) were: no action ($0.34M); gas collection and venting system, and monitoring ($0.44M); capping, regrading and revegetation, surface waste area cleanup, bank protection controls, gas collection and venting system, and monitoring ($15.9M); excavation and backfilling, regrading and revegetation, onsite incineration, offsite fly ash disposal, and monitoring ($166M); excavation and backfilling, regrading and revegetation, offsite disposal, and monitoring ($262M).

The community was quite interested in EPA's activities dealing with the site since the site problem had been a concern of the public in the past. The main concerns expressed were how EPA, the county, and state addressed the problem at the site. While a select number of residents believed that a buy-out of their homes and relocation should have been considered, the selected remedy was agreed on by the community to be its favored alternative.

WINTHROP TOWN LANDFILL, MAINE

The Winthrop site consists of two adjacent properties totalling approximately 13 acres, the Winthrop Town Landfill and the privately owned Savage Landfill, and is located in a former sand and gravel pit near the shore of Lake Annabessacook. The Town disposed of municipal, commercial, and industrial wastes in the landfill from the early 1950's until the mid-1970's. Free liquid waste as well as drummed wastes were deposited in the landfill. The site may pose a potential hazard to the lake, the wetlands, and to private water supplies.

The Record of Decision (ROD) was signed on November 22, 1985. The selected remedial action for this site includes: the extension of an alternate water supply landfill; construction of a chain link fence around the landfill, deed restrictions; prohibition of ground water withdrawals; groundwater monitoring; a RCRA cap over the entire landfill; completion of engineering design work (geologic, hydrogeologic, and treatability pilot studies); and establishment of an Alternate Concentration Limit (ACL) for each contaminant in the ground water based on RCRA criteria. If the ACL is exceeded, installation and operation of an interceptor system and construction and operation of a water treatment facility northeast of the landfill will be implemented. Total capital costs for the selected remedial alternative are estimated to be $6 Million (M). Operation and maintenance is estimated at $42 thousand per year if the ACLs are not exceeded. Should the ACLs be exceeded, O&M of the groundwater extraction and treatment system, along with monitoring and cap maintenance, will cost between $360 thousand and $1.48M per year, depending upon the method used to treat the contaminants.

The community was very involved and concurred in the remedy selection. Their main concerns were against any excavation or incineration. Additionally, the State of Maine concurred in the remedy.

The following alternatives list the main remedies compared in the evaluation: provide alternative water supply, monitor, and install institutional controls ($.56M) (hereby referred to as the first alternative); regrade the landfill, cap hotspots, combined with the components of the first alternative ($1.5M); groundwater extraction, regrading of landfill, cap hotspots, installation of various partial slurry walls, combined with components the first alternative ($7.5M); incineration ($8.5M); encapsulation of the landfill, combined with components of the first alternative with groundwater extraction added ($13.7M).

During the implementation of the remedial action (performed by the PRPs), a rotational slow failure was experienced on one slope of the cap, causing a crack in the surface at that point. The crack was winterized to prevent infiltration of runoff and further degradation, pending data collection and analysis in the subsequent construction season. The design calculation which had prefaced the failure was a bearing calculation performed by the PRPs. The assumptions made were questioned in the governmental review process, but concurred on with the understanding that this was an exercise of engineering judgement on the PRP's part, for which they would be ultimately responsible. The PRPs have submitted alternatives to consider for repair of the cap, and are in agreement with the government that more data is necessary for evaluation. The Region has recently approved a plan for gathering the necessary data. The PRPs will be responsible for implementation and any additional costs.

LIQUID DISPOSAL, MICHIGAN

Liquid Disposal, Inc. (LDI) ia a 6.8 acre site located in a residential/light industrial area in Shelby Township, Michigan. The site was first used as a source of sand and gravel prior to becoming a landfill around 1964. Between 1968 and 1982, LDI operated as a commercial incinerator of liquid waste. During this time, the site contained a large volume of hazardous substances stored in the waste oil and scrubber lagoons, ash sludge pits, above and below ground storage tanks, and in 55-gallon drums. Since 1982, EPA has completed four immediate removal actions at the site. As a result of these actions, no surface waste sources exist at the site. However, several hundred waste sample jars, old incinerator parts, emptied tanks, wooden pallets, miscellaneous containers, and other debris remain on-site.

Currently, on-site and off-site soil and shallow groundwater are contaminated with a wide variety of organic and inorganic chemicals. The primary contaminants of concern affecting the ground water and soil include: VOCs, semi-volatile organics, PCBs, barium, cadmium, and lead.

The selected remedial action for this site includes: on-site land disposal of all existing debris and equipment; on-site solidification/fixation of soil and waste; ground water extraction and treatment using air stripping and ion exchange; and construction of a slurry wall and impermeable cap containment system. Treatability studies will be performed during design. Fixation will reduce the mobility of the hazardous substances and may cause some minor reductions in toxicity. The total cost of the remedy is \$ 22.4 million (M). Solidification is expected to be effective for treatment of the relatively low mass of organic contaminants in the soil/waste.

Other major alternatives that were considered but not selected are identified below:

- On-site land disposal of debris, slurry wall, ground water pump and treat (\$5.4M). Not selected because of the lack of treatment.

- Off-site land disposal of debris, soil vapor extraction with solidification, and ground water pump and treat (\$21.8M). Not selected because of the questionable likelihood of success of vacuum extraction given soil conditions.

CONSERVATION CHEMICAL COMPANY, MISSOURI

The Conservation Chemical Company (CCC) site is a former treatment, storage, and disposal facility located less than 500 feet from the Missouri River within the city limits of Kansas City, Missouri. The site, which is comprised of six former unlined lagoons/treatment basins, is roughly 6 acres in size and is approximately 5 miles upstream of the Independence, Missouri, municipal wellfield. The site operated from about 1960 until 1980. Wastes received at the site included the following: acidic metal-finishing wastes, alkaline metal finishing wasted, solid cyanides, solvents and other organics, arsenic sulfide and reactive phosphorus refinery wastes and laboratory chemical waste. An initial stabilization initiative was performed during the mid-1970s in response to an order issued by the State of Missouri. The initial stabilization attempt was prior to EPA's involvement and represents earlier technology.

After several years of active litigation, EPA signed a "Preliminary Agreement" in August 1985 with the major defendants. Under this agreement, the defendants were required to initiate remedial design and reimburse the government for past costs. In addition, the defendants agreed to perform the remedial action (slurry wall and ground water pump & treat). Subsequent to signing the preliminary agreement, geotechnical investigations performed by the defendants revealed an ancient river channel in the bedrock under the site which would make the construction of the slurry wall not feasible. Because of these site conditions, it was concluded that other alternatives must be evaluated. In March 1987, EPA completed an addendum to the original Feasibility Study of 1985 which evaluated additional remedial options. The range of options considered were: excavation of soils with chemical solidification/stabilization, soil washing, RCRA capping and ground water pump and treatment.

The selected remedy, valued at \$21.4 million (M) consists of: surface cleanup and preparation, including demolition and disposal of existing building and other tanks and debris; installation of a protective two-layer surface cap over the existing fill; installation of a withdrawal well system to achieve an inward groundwater gradient along the perimeter of the site; and, a groundwater treatment system that will include sulfide precipitation. Any discharge must meet all applicable and relevant or appropriate requirements, including an NPDES permit. Perform offsite groundwater quality and water level monitoring to permit an assessment of changes in groundwater quality. The State of Missouri was consulted and concurred on the selected remedy. The site is currently in the design phase.

The main alternatives evaluated were a soil bentonite slurry wall (\$17.0M) and excavation and soil washing (\$23.3M). These alternatives were ruled out due to geologic uncertainties and technological limitations.

CHEMICAL CONTROL, NEW JERSEY

Chemical Control is a 2.2 acre site located in an industrial area in Elizabeth, New Jersey along the Elizabeth River. The site is subject to flooding due to the the proximity of the Elizabeth River and fluctuating water tables. The site operated from 1970-1978 in the hauling, treating and disposing of a wide variety of industrial waste.

In April 1980, the site was destroyed by fire. At that time, the State of New Jersey began an initial clean-up of the site. Three feet of soil was removed and replaced with three feet of gravel. The soils beneath the gravel are still highly contaminated with organics and some metals.

The selected remedial action includes treating approximately 18,000 cubic yards of contaminated soils by an in-situ chemical fixation process, repairing the berm that separates the site from the river, removal of surface debris, and sealing of the sanitary sewer lines under the site. The present-worth cost of the remedy is approximately $7.4 Million (M). This remedy would eliminate the mobility of the contaminants and the risk of contact with the contaminated soils. The remedy would not produce any adverse effects during implementation and achieves long-term protection in a relatively short time-frame. The remedy complies with all applicable or relevant and appropriate requirements. In addition, the State and community support the selected remedy.

Other major alternatives considered (and associated present worth costs) but not selected are identified below:

- Capping, ($0.415M); Saline condition of the ground water may adversely affect the integrity of any containment option.
- In-situ soil washing, ($4M); Not selected because of the longer time for implementation in comparison to the selected remedy.
- Excavation and on-site incineration, ($23M); Physical site constraints make implementation of this option difficult (i.e., 2 acre site, high chloride content of waste). If excavation and incineration were pursued, the potential impacts from a flood situation could be more of a threat to human health and the environment than the site poses at its present situation.

RENORA INC., NEW JERSEY

The Renora Inc. site, located in Middlesex County, New Jersey, is an approximately one acre area zoned for light industrial use. Adjacent to the site are an auto repair and body shop, welding, machinery, and electric supply shops. Within a half mile of the site is a residential area with three sensitive uses: a nursery school, senior citizens center, and an apartment complex. There are no public water supply well fields within one-half mile of the site. Twelve wells exist within one mile of the site, eight are believed to be residential but are no longer used for drinking water purposes.

EPA initiated a removal action to alleviate immediate problems. EPA installed a perimeter fence and secured leaking drums and tanks. The potentially responsible parties (PRPs) took over the removal action from EPA and subsequently agreed to conduct the RI/FS.

Based on the study results, a Record of Decision (ROD) was signed on September 29, 1987. The selected remedy is valued at $1.4 million (M) and includes the removal and offsite landfilling of PCB contaminated soils and the bioremediation of poly-aromatic hydrocarbons (PAHs) contaminated soils. Groundwater with low contamination levels will be remediated to drinking water standards primarily through its use as an irrigation media in the bioremediation system. The ROD provides for the use of a carbon filtration system for ground water should this approach fail to achieve appropriate levels. EPA is currently in negotiations with the PRPs for implemetation of the cleanup.

The decision to implement bioremediation as part of the remedy at Renora was based on the following: available information on the use of bioremediation at other hazardous waste sites, bioremediation of similar wastes have been extensively used by the oil refining industry; and, the remedy was supported by the State and the public. Additionally, three suppliers of bioremediation technologies were given site-specific information on the contamination at Renora. It was the unanimous opinion of these suppliers that bioremediation could be successfully implemented at the site.

Alternatives evaluated in the Feasibility Study included: site capping ($0.47M); excavation and offsite disposal of PCB and PAH contaminated soils ($2.2M); excavation and offsite incineration of PCB & PAH contaminated soils ($18.2 M); PCB excavation and offsite disposal with bioremediation of PAH contaminated soils ($1.4M); excavation and offsite incineration of all contaminated soils above background levels, with installation of a slurry wall and groundwater pump and treat ($76.7 M). The primary component of the selected remedy included bioremediation which is an innovative technology and which meets the requirements of SARA regarding the permanent reduction in toxicity, mobility and volume of hazardous substances. Additionally, it was the most cost effective remedy which attained all applicable, relevant and appropriate requirements.

PRISTINE INC., OHIO

The Pristine, Inc. site occupies approximately two acres in a suburb of Cincinnati. The site is bordered by residential and industrial areas. There are two aquifers under the site. The lower aquifer is the source for the regional water supply. Eight municipal wells serving the citizens of Reading are located approximately 300 feet northwest of the site. Pristine, Inc. began liquid waste disposal operations at the site in 1974 and began to operate a liquid waste incinerator there in 1977. There have been several PRP actions which removed much of the surficial waste at the site.

Soil and sediment in drainage ditches are contaminated with VOCs, semi-volatiles, and pesticides (up to 57 ppm). Ground water in the upper aquifer is contaminated primarily with VOCs such as benzene, vinyl chloride, tetrachloroethene, and 1-2,-dichloroethane (up to 150 ppm). The lower aquifer is contaminated with benzene and 1,2-dichloroethane (up to 780 ppb).

The selected remedy involves excavation and on-site consolidation of 1,725 cubic yards of contaminated sediment and soil; in-situ vitrification to an average depth of ten feet across the site (37,700 cubic yards); installation of a french drain along the eastern boundary; extraction of ground water from the lower aquifer using at least one extraction well; on-site treatment of groundwater using an air stripper with discharge to Mill Creek; decontamination of structures followed by removal and disposal at a solid waste landfill; access and deed restrictions; and groundwater monitoring. The total remedy cost is $ 21.7 million (M). Vitrification has been successful on clayey, silty soil similar to that found at the site. Pilot tests will be required during design. The State concurred with the remedy selected.

Other major alternatives that were considered but not selected included:

- On-site incineration with remediation of groundwater and structures ($ 51.5M). Ruled out because of: (1) higher cost without an increase in protectiveness, (2) materials handling problems, (3) potentially high concentrations of metals in incinerator ash, and (4) State opposition to incineration and preference for vitrification.

- RCRA cap ($ 3.1M). Not selected because of lack of treatment and potential for continued migration of contaminants.

COMPASS INDUSTRIES LANDFILL, OKLAHOMA

The Compass Industries site is an abandoned landfill west of Tulsa, Oklahoma. From 1930 through 1950, the site operated as a limestone quarry. From 1972 to 1976, it operated as one of the major landfills for municipal and industrial wastes in the Tulsa area under permit by the Oklahoma State Department of Health. Few records were kept on the exact type, quantity, and location of wastes in the landfill during its operation, although during site investigation activities, it was identified that a number of areas contain high concentrations of waste. This volume of waste represents an estimated 2% of the entire volume of waste contained in the landfill. The total volume of waste is estimated to be 620,000 cubic yards. The primary contaminants of concern affecting the shallow aquifer and overlying soil include metals and organics.

The selected remedial action for this site includes: RCRA capping, surface water diversion, implementation of ground water and air monitoring analysis programs, and collection and on-site treatment of contaminated ground-water from the upper perched, water-bearing zone (if deemed appropriate after compliance monitoring). The present worth cost for this remedial action is $12 Million (M). The primary routes of exposure from the Compass Industries site involve direct contact with the waste and surface water seeps generated by off-site migration of ground water. The capping alternative addresses each of these exposure routes as well as other potential modes of exposure and contaminant migration pathways. Capping the site eliminates the threats posed by direct contact with the surficial waste, and off-site transport of contaminated sediments and surface runoff. Air emissions will also be eliminated by capping, thus reducing the potential for exposure by inhalation. Ground water treatment will be provided, if ground water seepage exceeds appropriate standards. However, it is believed that capping the site will effectively reduce leachate generation and control seepage such that treatment will not be necessary. This approach for site cleanup is supported by the State of Oklahoma.

Other major remedial alternatives that were considered but not selected are identified below:

- Full on-site thermal destruction ($339M). Cost not commensurate with level of protection afforded by this technology

- Partial thermal destruction (2% of volume) ($17M). Added cost, versus cost of a RCRA cap, not commensurate with added benefits in protecting human health and the environment. State of Oklahoma did not support either thermal option.

SAND SPRINGS, OKLAHOMA

The Sand Springs site operated as a refinery from the turn of the century through the late 1940s. It has since been developed as an industrial area and consists of an abandoned solvent and waste oil recycler, active transformer salvage/recycler, active chemical manufacturers, and other light industries. The site is approximately 200 acres and includes two unlined acid sludges pits, acid sludge surficial contamination, two solvent and waste oil lagoons and contaminated sediments. The estimated volume of waste is 130,000 cubic yards. The contaminants include organics and metals. Shallow ground-water contamination will be assessed as a subsequent operable unit.

The Record of Decision for this site adopted the PRPs proposal for site remediation. The principal components of this remedy include: limited thermal destruction, and solidification/stabilization of all remaining sludges with containment of the resulting matrix in a RCRA cell to be constructed on-site. The estimated cost of this remedy is $38 Million (M). State, local agencies and residents support the PRPs' proposal. Pilot studies for stabilization and solidification were performed on-site by the PRPs on the acid sludge wastes during the RI/FS. Test results did not conclusively demonstrate the permanence of these technologies. However, EPA believes this is an innovative technology and is allowing the PRPs the opportunity to demonstrate its effectiveness through further testing. As part of the remedial design, the PRPs must demonstrate that solidification, will meet EPA approved criteria which will include chemical and physical testing requirements. Should this technology fail these design criteria, thermal destruction of the waste will be performed.

Other major remedial alternatives evaluated, but not selected include:

- On-site thermal destruction ($67M). Rated less favorable than solidification as the community was concerned that the site would be used to destroy hazardous waste from other sites, that thermal destruction would add to existing air pollution and that the local economy might suffer from the presence of a hazardous waste incinerator.

- Off-site thermal destruction ($425M). Short-term environmental risks and the added cost were among the factors for why this alternative was not selected.

TYSONS DUMP SITE, PENNSYLVANIA

The Tyson's Disposal Site in Upper Merion Township, Montgomery County, Pennsylvania operated from 1962 to 1970. It consisted of several lagoons containing septic and chemical waste. Since the lagoons were not lined, soils and ground water were contaminated. Immediate cleanup actions were initiated by EPA in March 1983 to limit exposure to nearby residents from chemical odors and liquid waste releases from the unsecured site. EPA also conducted a more detailed study, Remedial Investigation/ Feasibility Study (RI/FS), to determine the extent of contamination, impact on public health and the environment; and additional cleanup measures. The Agency selected these additional cleanup measures in The Record of Decision (ROD) signed December 31, 1984. The ROD, outlining EPA's selected remedy, calls for excavation of soils initially estimated to cost $5.7 Million (M) but later estimated to cost $17.7 (M). The Agency negotiated with potentially responsible parties (PRP) for 2 years to implement the selected remedy. During that time the Superfund law was amended (SARA) by Congress to include a bias for selecting treatment remedies. The PRPs proposed treatment alternatives during that time in which the Agency agreed to review. In addition, the PRPs also agreed on May 27, 1986, in an Administrative Order on Consent, to study offsite contamination.

The PRPs requested to be allowed to show though treatability studies that a vacuum extraction process would best meet the intent of SARA. The Agency decided that the responsible parties proposed remedy had merit. On March 31, 1988, EPA signed an amended ROD, thereby changing the preferred remedy from that described in the December 31, 1984 ROD. The amended ROD calls for a vacuum extraction remedy to be performed at the Tysons site. The vacuum extraction process is an in-situ treatment process used to clean soils that contain volatile compounds. This remedy is estimated to cost $10.2M. Both the State of Pennsylvania and the local community approve of the vacuum extraction remedy. The PRPs signed a consent decree in December of 1987 to implement the vacuum extraction remedy and they are currently developing the remedial design for the required work.

Other major alternatives evaluated included: site capping and ground water diversion ($3.7M); groundwater/leachate collection and treatment with surface sealing of contaminated areas ($2.1M); and construction of an on-site secure landfill ($2.9M). All three remedies were not selected since they did not effectively address potential threat to the groundwater table. In addition, the last remedy was not selected due to double handling of waste and time to implement.

DAVIS LIQUID WASTE, RHODE ISLAND

The site encompasses 15 acres in a rural residential section of Rhode Island. The site served as a disposal location for a variety of liquid and solid hazardous wastes throughout the 1970's. Presently, the site operates mainly as a staging and storage area for tires. It is bounded on the north and south by wetlands and swamp areas and there are 38 homes within one-half mile of the site.

Materials dumped at the site include sludge, oil, solvents, chemicals, and solids. Contaminants include tetrachloroethylene, 1,1-dichloroethylene, carbon tetrachloride, vinyl chloride, chloroform, and benzene. Data show that on-site soils, groundwater, and surface water, as well as off-site groundwater, are contaminated. Average levels of total volatile organics in on-site soil are over 10,000 ppb. Similar groundwater contaminant levels were found. The excavation of 600 drums was conducted in 1985 as part of a removal action.

The selected remedy is on-site incineration of 25,000 cubic yards of raw waste and contaminated soils, and groundwater treatment using oil and solids separation, metals precipitation, air stripping, and carbon adsorption. Treated groundwater will be discharged over the soils, flushing the soils in the recirculation area. Residents whose wells have shown signs of contamination will be supplied with an alternate water supply (hookup to nearby water supply). The total cost of the remedial action is $27.8 million (M). The Region has experienced some negative reaction to incineration from the community. It also anticipates resistance from the site's owner/operator when on-site remedial action is attempted. Therefore, the alternate water supply is necessary because of these expected delays in on-site remedial action start and because of the possibility of increased groundwater contamination during remedial action. The State of Rhode Island concurred with the selected remedy.

Other major alternatives that were considered but not selected include:

- On-site low temperature thermal soil treatment ($ 16.1 M). This was not selected since it involved off-site incineration of highly contaminated soils with on-site treatment of less contaminated soils; therefore, it is more expensive and less easily implementable than on-site incineration.
- Off-site incineration ($ 70M). This was not selected because of high costs with no increase in protectiveness.

CRYSTAL CITY AIRPORT, TEXAS

Pesticide operations occurred from the 1950's until 1982 at the Crystal City Airport located in Crystal City, Texas. Pesticides found include DDT, toxaphene and dieldrin. The contaminants found on the 120-acre site are generally confined to the runway area in the first one or two feet of soil. Soils in the area are characterized by high clay content and are of extremely low permeability. No ground water was encountered on the site to a depth of 180 feet. The major drinking water aquifer for the area is at a depth of 700 feet.

Two removal actions were performed at this site. The first removal action involved placing 40 cubic yards of waste and 50-70 drums of material into 2 on-site disposal cells. The removal was undertaken to eliminate the imminent threat posed by direct contact exposure with the waste.

The RI/FS was subsequently initiated to identify an appropriate site remediation plan. Based on the results of these investigations, on-site consolidation of waste, and placement of a RCRA cap over the material at a cost of $1.6 Million (M) dollars, was selected as the site remedy. As a component of the remedy, the waste disposed of in the initial removal will be relocated to the consolidation cell. Encapsulating this material beneath a RCRA cap will provide an added degree of protection rather than leaving the waste in its current state. It was concluded that consolidation and containment of relatively immobile waste is an appropriate remedy. Site soils are impermeable and ground water contamination is not a threat. The increased cost of treatment, as well as the problems associated with implementability and cross media impacts weigh in favor of the containment option. The selected remedy was judged to be equivalent to treatment by solidification since the same level of contaminant mobility would be achieved. The State of Texas concurred with the selected remedy.

Other major alternatives that were considered but not selected are identified below:

- Solidification of waste and landfilling ($3.8M). Not selected because there was no significant improvement in the level of protection for the added cost.
- Soil washing ($16M). Concerned about the high cost and transfer of contaminants to rinse water.
- Incineration ($11M). Judged difficult to implement due to treatment train needed to treat arsenic. Community opposition to technology.

FRENCH LIMITED, TEXAS

The French Limited site is an abandoned industrial waste management facility located east of Houston, Texas. The 22.5 acre site contains a 7.3 acre lagoon. Between 1966 and 1972, approximately 300,000 cubic yards of industrial wastes from area petrochemical companies were disposed of at the site. The majority of the waste received was deposited in the unlined pit, formerly an active sand pit. The wastes have been classified into four media categories: sludges/sediments, contaminated soils, contaminated surface waters, and contaminated ground water. Contaminants identified in these media include organics, metals, and PCBs.

During the RI/FS, the PRPs performed a treatability study for insitu biodegradation. Selection of a remedial alternative was delayed until results of the pilot study were developed and could be analyzed for effectiveness. The Record of Decision was signed on March 24, 1988, selecting bioremediation as the site remedy. The estimated cost for this alternative is $47 Million (M). The State of Texas concurred with the selected remedy.

Other alternatives that were considered but not selected are identified below:

- On-site thermal destruction ($120M). Community expressed significant concerns for alternatives which involve incineration

- On-site thermal destruction with stabilization of some wastes ($75M). Reliability of stabilization technology is questionable.

TACOMA TAR PITS, WASHINGTON

The Tacoma Tar Pits site is part of the Commencement Bay - Nearshore/Tideflats Superfund Site located in an industrial area in Tacoma, Washington. Between 1924 and 1982, the site operated as a coal gasification plant and later a metal recycling facility. Between 1981 and 1983, EPA began its initial investigations of the site. Potentially responsible parties (PRPs) agreed to a Remedial Investigation/Feasibility Study to determine the impact and extent of the contamination at the site and alternatives for cleanup.

The site contains two ponds, a small waste pit, and various surface-water drainage ditches. Waste materials identified from the coal gasification process disposed at the site include coal tar liquors, coal ash and tars. Chemical contaminants identified from these waste materials included aromatic and polynuclear aromatic hydrocarbons, cyanide, arsenic, mercury and lead. These contaminants pose an immediate threat to local industrial groundwater use, fish and shellfish populations in the Commencement Bay and backwater areas, and surface water quality.

The Record of Decision (ROD) was selected by EPA and approved by the State of Washington December 30,1987. The remedy is estimated to cost $3.4 million (M) includes: soil excavation and treatment/stabilization of contaminated soils (polymer and cement) and reduction of surface water infiltration by capping stabilized matrix with asphalt. The selected remedy was chosen as the best combination of available technologies, which when implemented would provide maximum protection of the environment and human health while considering toxicity, mobility, reduction of volume, preference for treatment, and cost. A total of 19 preliminary alternatives were considered before selection of this remedy, nine of which included options for groundwater extraction and treatment. Technologies considered in these alternatives included dust control, capping, stabilization, excavation with offsite landfilling, electric pyrolysis, incineration, and in-situ vitrification for the soils. The alternatives of similiar protectiveness were priced between $8.1M and $242.9M.

Prior to 1981, the local residents were actively involved in environmental issues regarding the Commencement Bay (Tar Pits) area sites. The level of local citizen concern decreased considerably during the RI/FS. Very few public comments were received by EPA on the proposed plan and ROD. The site is located within a heavily industrialized area, with no adjacent residential community. The State of Washington was consulted during the development of the remedy and provided written concurrence.

SCHMALTZ DUMP, WISCONSIN

The Schmaltz Dump site, occupying seven acres of the Waverly Beach wetlands area, is located on the north shore of Lake Winnebago in the town of Harrison, Wisconsin. Industries dumped wastes at various locations along the north shore of Lake Winnebago for several years. Mr. Gerald Schmaltz, the previous owner, began filling his property in 1968. Records show that hauled wastes consisted of solid wastes, car bodies, stones, trees, pulp chips, and mash. Between 1972 and 1973, the site accepted fly ash and bottom ash from Menasha Utility and, in 1978 and 1979, Schmaltz accepted the demolition debris of a building owned by the Allis-Chambers Corporation. In August 1985, a Record of Decision was signed approving an operable unit to address the PCB contamination.

Initial on-site sampling in early 1979 determined that an area containing the Allis-Chambers debris was contaminated with concentrations of PCBs as high as 3,100 ppm with lead and chromium also detected at up to 1940 ppm and 964 ppm, respectively. The wastes have not been leachable in EP Toxicity tests. The site is underlain by two aquifers. The upper aquifer shows high natural levels of iron, magnesium, potassium, sodium, ammonia, strontium, and boron. The public health evaluation identified direct contact with lead and chromium as the pathway of concern. Ground water was determined not to be a public health threat because chromium concentrations are below standards.

The selected remedial action for this site includes: installation of a low permeability, compacted earth material cap over approximately seven acres of lead and chromium contaminated soils; installation of a slurry wall; and ground water monitoring. A voluntary well abandonment program for nearby wells is also proposed. The total present worth cost of the remedy is $ 787,000.

Other major alternatives that were considered but not selected are identified below:

- Slurry wall and cap ($ 3.2 million (M)). Not selected because direct contact is the only threat at the site.
- RCRA Cap ($ 2.4M). Not necessary to prevent direct contact.
- Excavation, solidification, and stabilization ($ 2.8M). Solidification was not necessary since the contaminants are immobile.

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